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THE SURGICAL CLINICS
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Volume 5 Number 6

CLINIC OF DR JOHN B DEAVER

LANKENAU HOSPITAL

Prepared in collaboration with
DR V G BURDEN
Assistant Surgeon, Misericordia Hospital

THE cases here presented were operated before the Fellows of the American College of Surgeons during their meeting in Philadelphia, October 25–29, 1925, and have been grouped for convenience of presentation and discussion as follows

PERITONITIS—PERITONEAL INFECTION

I wish to discuss peritonitis, and to review some of the important points in the anatomy and physiology of the peritoneal membrane, not because I have anything new to offer, but because of the importance of the subject, and because I believe students and practitioners should have a better conception of it than they have

The fundamental principles of the successful treatment of any disease is a knowledge of its origin, its method of extension, and its termination Knowledge of the origin of peritonitis is the knowledge of the conditions causing it The latter may be classified "infectious" and "non infectious"

NOTE —All the clinics in this number were given at various hospitals during the meeting of the American Congress of Surgeons in Philadelphia last October The February number of the Surgical Clinics of North America will also be devoted to Philadelphia and will contain the clinics given during the Congress not reported in this issue

The non infectious conditions giving rise to peritonitis are tuberculosis carcinoma and some chemical agents, such as blood urine bile etc Peritonitis caused by these conditions becomes infectious in the late stage therefore it seems rather like beg ging the question to consider peritonitis other than an infectious disease We shall therefore consider only infectious peritonitis

Most abdominal ailments as well as some other ailments having their origin outside of the abdomen have a tendency to develop peritoneal infection with all its serious possibilities

The peritoneum is a serous membrane composed of an endo thelial layer and a basement membrane It is attached by connective tissue which is freely supplied with lymphatics and blood vessels to the organ which it wholly or partly envelops and to the wall of the abdomen within which it is placed The endothelial layer holds the same relation to the underlying sub peritoneal connective tissue as the epidermis does to the under lying true skin As in the skin infection remains local so long as the epidermis is intact so within the cavity of the perito neum infection is local so long as the endothelial layer is intact Anatomically the peritoneum in the male is a closed sac while in the female it is an open sac because the fimbriated ends of the fallopian tubes are in communication with it The perit oneal cavity is an empty space the endothelial layer being kept moist so to speak by a thin film of lymph

Formerly the peritoneum was believed to be an immense closed sac with a connection between the peritoneal cavity and the subperitoneal tissues through minute openings or stomata in the endothelium These were supposed to be the open ings or mouths of the subperitoneal lymphatics (making the peritoneum a part of the lymph system) and were believed to be guarded by the surrounding endothelial cells which by their property of contractility opened or closed the stomata as need be In addition to these smaller openings called stig mata were thought to be present which were interpreted as artefacts due to stretching or shrinking of the cells caused by the action of reagents such as precipitated stains or as openings left by the passage of leukocytes

All of the abdominal organs whether partly or wholly covered by peritoneum, are shut off from the peritoneal cavity by the covering visceral layer, and can only occupy the cavity or a part of it as a result of destruction of the visceral covering In such circumstances the peritoneal cavity is perforated

The two chief functions of the peritoneum are absorption and exudation While it possesses wonderful powers of absorption, it also has an almost unlimited power of depositing exudate Both of these functions play a most important part in the regeneration of the peritoneum, provided it has not been embarrassed or handicapped by ill advised treatment In animals, such as the dog, the peritoneum is able to absorb an amount equal to one eighth of its body weight Absorption depends upon pressure of the abdominal muscles and respiratory contraction in which the diaphragm plays a most important rôle, for, by its contraction and relaxation fluids and particles are aspirated from the peritoneum and forced onward Absorption also depends on peristalsis, which diffuses fluids, and upon the vitality of the endothelial lining of the peritoneum The size of the peritoneum or its surface area, is equal to that of the skin covering the body, 17,500 square inches This extent of the peritoneal surface makes the term "general peritonitis" an incorrect one, as the membrane is never entirely involved

The two outstanding conditions in peritonitis are inflammation and toxemia

The first is the battle between nature s forces and those of the infecting bacteria, the second is the result of the battle either victory on the part of nature or defeat in the overwhelming of her forces by the bacteria resulting in death

An understanding of the anatomy and physiology of the peritoneum, its powers of absorption and exudation, the paths of absorption, as well as what hinders and favors absorption, is essential to the correct treatment of peritoneal infection The rationale of anatomic and physiologic rest, which in the Lankenau Hospital is known as "regulation treatment," is based on such knowledge

Absorption and exudation are two of the chief defensive

powers of the peritoneum Bacteriologic study of the products of peritoneal inflammation has demonstrated other powers of defence in the shape of bacterial serum the pouring out of leu kocytes and phagocytes etc often referred to as scavengers con suming and destroying the pathologi bacteria that have invaded the cavity It is when these forces of defence are overwhelmed by the invading bacteria that pus formation or death from the excessive toxins results

Absorption depends upon the presence of peristalsis to dis tribute infection upon the activity of the movements of the diaphragm which like the heart is always moving upon the vitality and denucleation of the endothelial lining Absorption is hindered or prevented by diminished peristalsis shallow respiration infiltration of the subperitoneal connective tissue venous congestion lowered abdominal temperature lowered intra abdominal pressure the application of cold which affects the muscular and nervous elements concerned in absorption, and by the sitting posture

Absorption is favored by exfoliation of the endothelium by tearing of adhesions and by vasomotor paresis The avenues of absorption are the lymphatics and the blood vessels the former being chiefly concerned in the absorption of fluids soluble sub stances and solids such as bacteria The portions of the peri toneum most active in absorption are the diaphragmatic and omental areas and the enteronic area in the order named

Whenever the endothelial covering is permanently destroyed at any point granulation tissue springs up and attaches itself to adjacent structures forming adhesions which may be either defensive or offensive

The balance between exudation and absorption is such that in normal circumstances there is at no time an excess of fluid The remarkable rapidity with which the peritoneum can exude fluids is seen in the large amount of fluid present in the peritoneal cavity a few hours after perforation of the stomach or intestine

The phenomena of exudation are entirely protective and defensive in nature Peritoneal exudation with deposits of fibrin encapsulates bacteria and imprisons them until they can be

engulfed by the microphages or neutrophilic leukocytes. The insulted peritoneum weeps and by its tears it defends itself. The insults result from intrusion of bacteria, therefore clinically and practically the causes of peritonitis are infective. Foreign substances, such as bile, urine, blood, especially clotted blood, etc., set up an irritation of the peritoneum, and interfere with the functions of the intestines and the integrity of the walls of the intestines so that in a short time the bacteria make their way into the peritoneal cavity. Peritoneal fluid, even a very small amount, as seen very early in peritonitis, has great bactericidal powers. Therefore, it is our practice in ruptured ectopic pregnancies to wash out the blood-clots with normal salt solution.

The diagnosis of peritoneal infection *per se* is based on the presence of pain, localized or generalized, and vomiting in the early stage, rigidity of the abdominal muscles, tenderness, and more or less limited inspiration depending upon the extent of the peritoneal involvement. Late in the case there is abdominal distention, persistent regurgitant vomiting due to intestinal paresis, rapid and weak pulse, more or less cyanosis, depending upon the degree of toxemia, which means vasomotor paresis, hypoperistalsis, or the absence of peristalsis, obstipation with inability to pass gas; the peritoneal facies, cold perspiration of the forehead and often of the body as well, and the bright eye and active brain.

In determining the cause of peritoneal infection the diagnosis of the lesion causing it is of the first importance. Appendicitis is the most common cause and, as a rule, is not difficult to diagnose if the history of the case is clear and the patient is seen before the appearance of diffused peritonitis and general abdominal distention. Diffuse peritonitis can so cloud the picture that the local physical signs cannot be made out. The dictum in the acute abdomen—think first, last, and always of the appendix—is worth while remembering. If the history is not clear, light may be obtained by reviewing the more remote history of the case. The different locations of the appendix are of importance. The appendix in the great majority of cases lies behind the cecum and colon or to the outer side of one or both.

The second most common location is in the pelvis This location of the appendix is an important factor in diagnosis, especially in the female, where differentiation of an acute appendicitis from pelvic abscess is demanded, and likewise is responsible for the frequent association of acute tubo ovarian disease and appendicitis

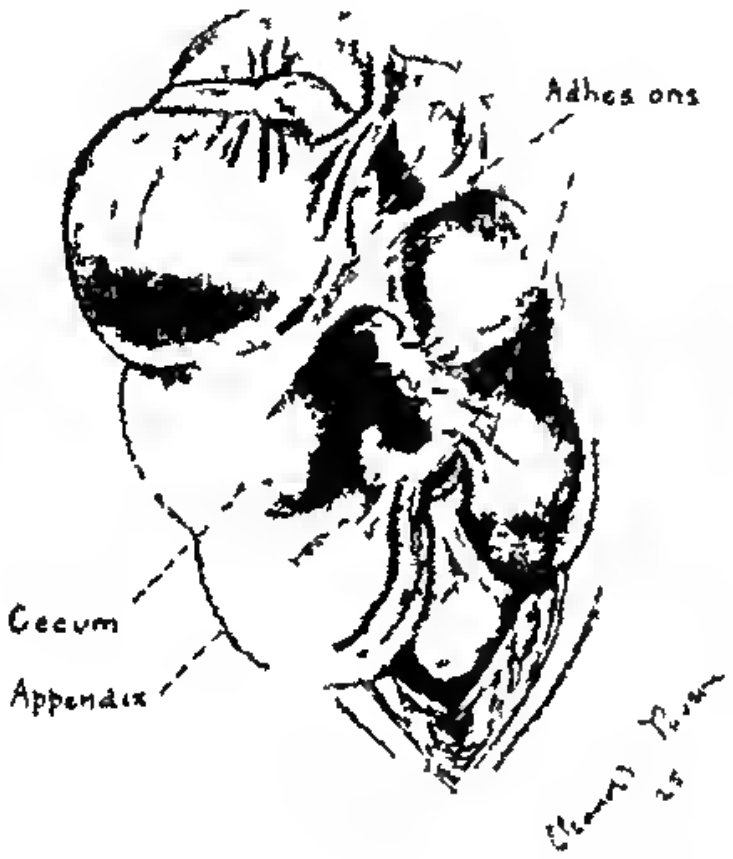

Fig 535 —Retrocecal appendix Cecum pulled out of wound and reflected upward to show appendix adherent to posterior surface

The inflamed appendix when holding a position higher than normal causes confusion and makes differentiation from upper abdominal disease not only difficult but at times impossible The symptoms most often so strongly suggest disease of the gall bladder that the patient is brought to the operating table with that diagnosis It is no unusual thing in such cases to find a perfectly normal gall bladder but a very markedly diseased

appendix as the cause of the trouble. This phenomenon, however, is usually associated with a chronic condition, but our concern at this time is rather with acute conditions which have been allowed to go on to peritoneal infection.

The two least common positions of the appendix are beneath the terminal mesentery of the ileum and pointing to the left, and above the terminal mesentery of the ileum and pointing upward and to the left. These are important and should be borne in mind in dealing with left-sided abdominal inflammations as, for example, in the neighborhood of the sigmoid, the spleen, the greater curvature of the stomach, and the left half of the transverse colon.

The type of peritoneal infection, with the exception of gonococcal and postpuerperal streptococcic infection, has not the same operative import as the peritonitis caused by appendicitis, intestinal obstruction, diverticulitis, the pneumococcus, etc. The peritoneal infection of diverticulitis, like that of appendicitis, is of the colon bacillus type, as is also that of acute intestinal obstruction and of torsion of the great omentum.

Peritoneal infection occurs as local or circumscribed and diffusing and diffused. The success of operation as well as the successful outcome of the case depends, as I view it, upon the recognition of these varieties and shaping the operation accordingly.

In local or circumscribed peritoneal infection, other than the gonococcal or postpuerperal streptococcic type, with localization of the lesion, immediate operation is the procedure.

In diffuse spreading peritoneal infection with localization of the lesion, operation may be undertaken, provided that immediately upon exposing the site of the lesion moist gauze pads are carefully interposed between the site of the lesion and the surrounding structures. To be successful the lesion must not be attacked until this is thoroughly done. Arranging moist warm gauze pads and thus guarding against contamination, as well as maintaining the normal intra-abdominal temperature, is the crux of the situation. We spend much more time in doing this than in exposing the lesion. The late John B. Murphy once asked me to what I

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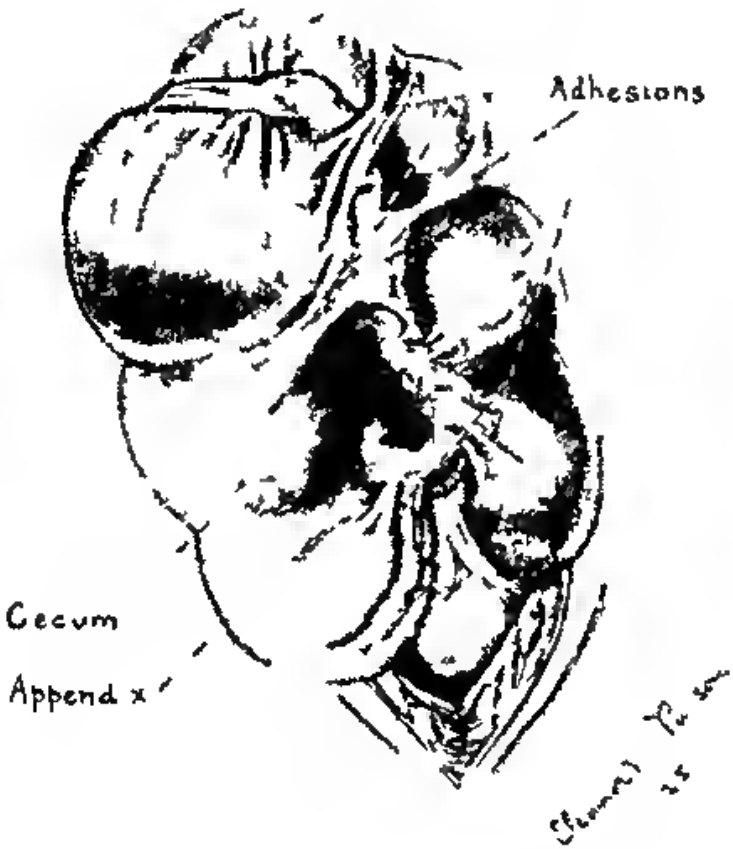

Fig 535 Retrocecal append x Cecum pulled out of wound and reflected upward to show appendix adherent to posterior surface

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Ice reduces abdominal temperature and renders less irritable the muscular and nervous elements concerned in absorption

In the majority of cases diffusing and diffused peritonitis other than the gonococcal and postpuerperal types are more safely treated by anatomic and physiologic rest than by operation even when the lesion can be localized

In diffused peritonitis operation may be undertaken provided the patient's general condition permits when the distention and tenderness have subsided and peristalsis is restored, except over and in the immediate neighborhood of the original lesion which to palpation is exquisitely tender, and flat or tense upon percussion After the peritoneal infection has subsided, a rise in temperature with circumscribed rigidity and tenderness, sweating of the forehead and perhaps of the body, indicate the presence of an abscess whether or not the leukocyte count is high Usually in these conditions the polynuclear count will be higher than the leukocyte count

In extreme cases of appendical inflammation all of the right lateral abdomen from the diaphragm to the floor of pelvis may be involved This is not at all uncommon in the service of the Lankenau Hospital where so many late cases are seen

The common causes of peritoneal infection of the upper abdomen in the order of their frequency, are high intestinal obstruction cholecystitis perforated duodenal or gastric ulcer and acute pancreatitis The diagnosis of these conditions are possible as a rule by careful interpretation of the history, with careful and painstaking physical examination It will be readily seen that examination by *x* ray in these acute cases is not feasible however some of them will perhaps have had a roentgenologic study for a chronic condition of which the present acute attack is the outcome It is well to inquire into this when taking the history

Peritoneal infection the result of a perforated duodenal or gastric ulcer in one previously well does not, as a rule, occur until several hours after the perforation

In acute pancreatitis the peritoneal infection is ushered in with most acute pain immediately followed by profound shock,

and this in turn by persistent vomiting and hiccup and frequently cyanosis Vomiting is not relieved even temporarily by washing out the stomach differing in this respect from the vomiting of most of the other acute abdominal conditions

The treatment of non operative as well as postoperative peritoneal infection is anatomic and physiologic rest

The peritoneal infection of acute cholecystitis is associated with a history of gall bladder dyspepsia with tenderness most marked over the region of the gall bladder

In peritoneal infection of acute appendicitis there is usually a typical history of appendicitis and of early purgation

A peritonitis that has advanced to the stage of abdominal distention with diminution of the muscular rigidity consequent upon the distention will often make the recognition of the underlying cause impossible This may be said to be true of most of the varieties of lower abdominal peritoneal infection except that caused by disease of the uterine appendages where the findings by vaginal touch are not obscured by distention

Peritoneal infection the result of a pelvic appendicitis in the female may so closely simulate the peritonitis of a true pelvic inflammation that differentiation may be impossible Here a careful interpretation of the history and especially the presence of left sided abdominal pain which is so common in this type of appendicitis are highly important

We cannot always be sure of the type of organism in these cases If appendical in origin the peritoneal infection is most commonly due either to the colon bacillus or the streptococcus Only by examination of bacteriologic smears of the extraperitoneal exudate at operation can the type be definitely determined With the abdomen opened the smear and culture must be made not only from the site of but also distal to the lesion Incidentally I may say that Dr Reimann Director of our Research Laboratory is in touch with me during all our operations observing the pathology *in situ* as exposed at operation thus making sure that the ground is thoroughly covered while his staff makes smears cultures and frozen sections This cooperation between the director and the staff of the laboratory

reacts to the benefit of the patient The laboratory findings, of course, help me to decide the question of drainage

Peritoneal infection is not an idiopathic condition, but traumatic, in that the peritoneum has been injured by vicious organisms which nature in her masterly manner through her defenses—leukocytosis phagocytosis, bactericidal serum etc—battles to control, therefore where surgery cannot aid in the removal of the focus from which the vicious organisms were let loose masterly inactivity is better than surgical activity The latter aids bacterial onslaught by breaking down nature's defenses and thus opens new fields for bacterial invasion, scattering the infection and diminishing the chance of immunity, in short lowers the resistance of the tissues, and thus aids instead of crippling the enemy

In diffused peritoneal infection with a silent belly—absence of peristalsis—where only the pulsation of the aorta is heard, and that much more intense than normally we have rarely seen good come from operation, while under strictly carried out anatomic and physiologic rest we have seen the peritonitis subside and the case reach an operable stage and operation safely done

DUODENAL ULCER

This patient is an engineer, aged fifty one, who has had symptoms of duodenal ulcer for twenty five years and has been under medical treatment For the past five weeks he has vomited all solid food and has lost 12 pounds He has tenderness over the epigastrium *x* ray examination shows deformity of the duodenal cap and laboratory tests show a hyperacidity

Operation Duodenal ulcer causing obstruction of the pylorus and adhesions to the gall bladder The experience of this clinic is that inflammatory obstruction of the pylorus is practically always due to duodenal and not to gastric ulcer There is also some inflammatory infiltration of the head of the pancreas A posterior gastro enterostomy was made

Recovery was uneventful

The second patient is a carpenter aged twenty seven who has had symptoms of ulcer for four years and has received much medical treatment The stools have been tarry at times There is slight tenderness and rigidity over the upper right rectus. *x* Ray examination shows deformity of the duodenal cap

Operation The gall bladder is diseased and adherent to the hepatic flexure of the colon There is a duodenal ulcer on the posterolateral wall covered by adhesions Appendectomy posterior gastro enterostomy and cholecystectomy were performed and a glass tube placed in the subhepatic fossa

The patient made a good recovery

The third patient is a lawyer aged twenty six who has had a recent history of ulcer and three hours ago was seized with sudden agonizing epigastric pain There is board like rigidity of the abdomen and generalized tenderness

Operation Free peritoneal fluid found in peritoneal cavity An ulcer with a small perforation was exposed on the anterior wall of the duodenum The ulcer was cauterized and oversewn and a posterior gastro enterostomy and appendectomy performed A glass tube was placed in the pelvis through a suprapubic incision

The patient was able to leave the hospital on the twenty third day

The diagnosis of the typical duodenal ulcer can and usually is made from the history When *x* ray examination which should always be made is affirmative we feel better satisfied but a negative *x* ray does not always mean that an ulcer is not present In such circumstances if we have the clinical evidence of pathology in the upper right abdomen and the physical examination harmonizes with the clinical findings we do not hesitate about operation If the appendix has not been removed we take it out and usually through a McBurney incision It is our experience in this clinic that in nearly all cases of upper right abdominal pathology the appendix is diseased therefore we are of the opinion that some of the infection responsible for this pathology is due to the appendix since that organ

is responsible for a large number of intra-abdominal infections and the greatest number of deaths from intra-abdominal disease So long as there is the portal and the lymphatic system of vessels, just so long will the appendix figure in the future as it does now, and has figured in the past, as the arch enemy of the upper abdomen I am as reasonably sure of this as I am that we are gathered here this afternoon This is being proved, as far as anything can be proved, many times daily in this clinic

Fig 536 —Perforating duodenal ulcer with area of induration, diagram (Fig 537).

all of the living pathologic specimens are immediately to critical examination by Dr Reimann, the Director Research Laboratory

I don't believe that a chronic ulcer is ever healed treatment We know that an ulcer may be active quiescent period when the patient is free of symptoms medical treatment may relieve the symptoms but the ulcer Nearly all the ulcers which I have

prolonged medical treatment are shown microscopically to be unhealed The cards are on the table Let those who claim that medical treatment causes healing match them if they can *x* Ray evidence of healing is not reliable because the deformity of duodenal ulcer persists even after gastro enterostomy In case the ulcer has been excised the resulting deformity of the duodenum should not be mistaken in later *x* ray examinations for a new ulcer In the majority of cases the results of gastro enterostomy are satisfactory but a certain small percentage of cases will have recurrence of symptoms which usually means a marginal ulcer We occasionally find that the operation has failed to control the acidity and that a cure is brought about by resection of the stomach If in some way this group of cases could be selected primarily then the indications for subtotal gastrectomy for duodenal ulcer would be defined For gastric ulcer I always favor resection of the stomach

A perforated ulcer whether of the stomach or duodenum unless there is a forbidding degree of peritonitis should always indicate posterior gastro enterostomy Merely to close the perforation is not advisable If you do a gastro enterostomy at the same time you will have no regrets afterward I know this is correct although it is not the consensus of opinion If you fail to make a gastro enterostomy particularly in cases of duodenal ulcer you will occasionally get a duodenal fistula Not all of these fistulæ heal spontaneously Some of the patients die Closure of the perforation sometimes jeopardizes the lumen of the duodenum and results in gastric retention and vomiting

I do not believe that perforation cures the ulcer because many patients in whom the ulcer is oversewn continue to have symptoms which subsequently require gastro enterostomy

In cases of perforated ulcer with free fluid I make a separate incision in the hypogastrium through which a glass tube is placed in the pelvis This provides excellent drainage by means of the small lateral openings in the lower end of the tube The nurse aspirates the tube frequently by means of a syringe to which is attached a rubber tube and catheter and rotates it several times daily so that tags of omentum do not become

adherent through the perforations When the fluid becomes straw colored, usually after twelve to twenty four hours, a smear is made, and, if sterile, the tube is withdrawn, if not sterile, a rubber drainage tube is inserted and the glass tube slipped out over it

In the technic of gastro enterostomy there are several guiding principles the details of which vary with the operator I believe the opening in the stomach should be obliquely downward from right to left, reaching the greater curvature at the most depend-

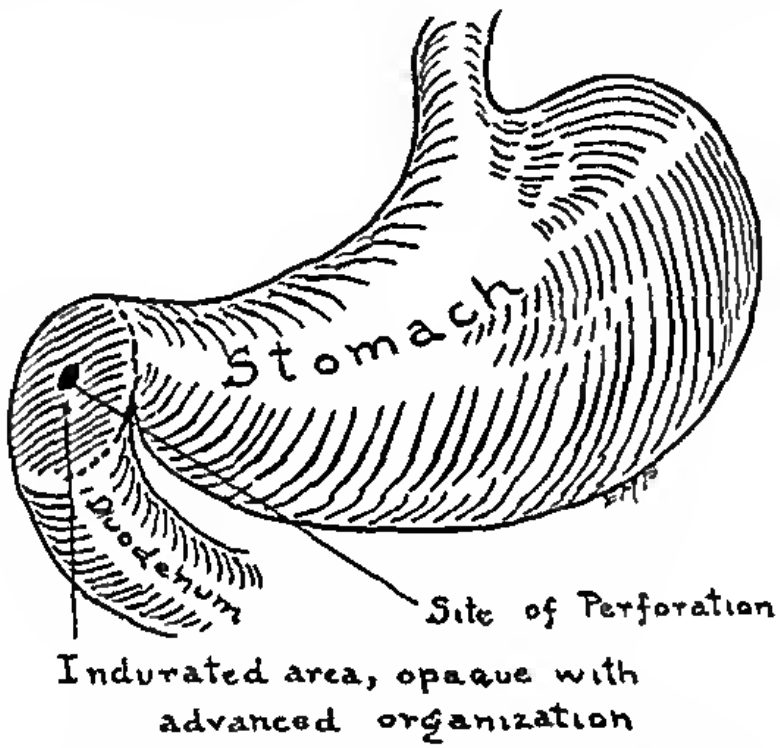

Fig 537 —Perforating duodenal ulcer Subtotal gastrectomy done

ent part of the stomach The opening should be ample in size, about 2 to $2\frac{1}{2}$ inches depending on the size of the stomach, The jejunum should be picked up so that its natural direction usually right to left, is not disturbed Occasionally it will be found turned to the right A short loop which allows for changes in size and shape of the stomach and at the same time avoids redundancy, should be used In making the anastomosis I use clamps, all catgut sutures, and a continuous mattress suture loop on the inside It is important to fasten the margins of the mesocolon to the stomach above the anastomosis to prevent herniation and obstruction

In a very few cases of acute perforation of a duodenal ulcer there will be found a large area of induration and exudate around the opening This tissue will not hold sutures making closure of the perforation very difficult and sometimes uncertain with the result that a duodenal fistula may occur In a few such cases which have been seen within a few hours after the perforation I have made a subtotal gastrectomy (Billroth II) after amputating the duodenum below the site of induration The results have been very satisfactory When these cases are seen late after the occurrence of perforation such radical measures are not safe it is best to close the perforation and reinforce it by suturing omentum over it and to make a posterior gastro enterostomy introducing drainage at the site of the lesion Figure 537 shows a case in which this operation was done

FECAL FISTULA

This man aged twenty nine was admitted to the hospital about two weeks ago in an attack of acute appendicitis At operation we found a perforated appendix with a large amount of free pus Drainage was provided for by rubber dam gauze and a glass tube

He recovered from the acute condition but with a fecal fistula the condition for which we are now operating He has been given spinal anesthesia apothesine Dissecting out the fistulous tract I find it leads down to the terminal ileum at the site of two openings These are closed but fearing the lumen of the bowel has been too much reduced I think it best to make an ileocolostomy

The patient is still in the hospital and is making a good recovery

I thought it might be of interest to make a short report on appendical fecal fistula since it is one of our more or less constant companions in the Lankenau Clinic and no doubt also in other hospitals where a great many operations for acute appendicitis are performed

The complication of appendicitis by fecal fistula is one

peculiarly confined to the case presenting perforation, abscess, and drainage. The last 200 cases of appendical fecal fistula reported from the Lankenau Hospital Clinic occurred among a series of 4063 cases of acute appendicitis, an incidence of approximately 5 per cent In every instance pus was present in more or less amounts, and required drainage either with gauze, cigarette drains, or glass tubes. In the vast majority of cases some ulceration of the cecum or terminal ileum was noted at the time of primary operation. The cases which showed perforation at the base of the appendix displayed a peculiar tendency to the formation of a fecal fistula, owing to the amount of inflammatory reaction and friability of the tissues which must be relied upon for turning in the stump.

Of the 200 fistulas, 74, or 37 per cent., healed spontaneously, while 97, or 48.5 per cent., required operative repair. The remainder, 29, or 14.5 per cent., left the hospital having refused operation, or were sent home to recuperate and to return later for operation, but failed to do so. No doubt a certain percentage of the latter closed spontaneously later on, and can, therefore, be included among that number.

The longest duration of fecal drainage before operative relief was sought was in a patient who had had an intermittent discharge for seven years; while the shortest duration of the fistula was a case which closed spontaneously in twelve hours. As a rule, a period of trial for possible spontaneous closure was permitted to pass before deciding to operate, the length of the time depending upon the general physical condition, the amount and character of the drainage, and the mental attitude of the patient.

The type of operation for repair of the fistula depends, of course, upon the conditions existent at the time. In 60 per cent. of the cases simple inversion of the fistulous opening by a purse-string linen suture reinforced by an additional suture line was all the surgery required. In 15 per cent. the condition of the bowel surrounding the fistula was such as to excite doubt as to its regenerative power in the presence of the usual fecal stream, so that an ileocolostomy was performed to short-circuit the affected bowel after inversion and reinforcement of the fistula.

The site of the anastomosis was usually from a convenient point near the terminal ileum to the transverse colon Twenty three per cent of the cases presented either multiple fistulæ or else the fistula was so large as to preclude closure with maintenance of the lumen of the bowel Some cases showed extensive ulceration in the part of the bowel surrounding the fistula so that hope for the recovery of this portion of the bowel had to be abandoned These required resection of the bowel varying from a small portion of the cecum to resection of a foot or more of the terminal ileum with the cecum and entire ascending colon Ileocolostomy was of course the last stage of the operation

Eighty of the 97 operated cases recovered and were discharged perfectly healed In 8 instances there was a recurrence of the fistula while 9 cases died after operation from shock cardiac failure or other causes

Nature alone was thus able to heal 37 per cent of cases but in nearly 50 per cent she needed the timely aid of the scalpel and the needle after which 80 per cent joined the ranks of the sound in body having successfully turned back the insidious attacks of the treacherous appendix

TUBERCULOUS PERITONITIS

This man colored aged thirty has had more or less constant pain in the right lower abdominal quadrant for the past five months Two weeks ago he had a severe attack of pain associated with vomiting The pain has persisted and at times has been severe There has been some loss of weight He is very tender over the right side of the abdomen which is rigid *x* Ray examination of the chest is negative Diagnosis Tuberculous peritonitis

Operation A right rectus incision revealed tubercles on the intestine and mesentery as well as a considerable amount of plastic exudate The presence of the latter makes the prognosis unfavorable

There was no material improvement in his condition following operation and he was transferred to the medical service

There are two types of tuberculous peritonitis—the serous and the plastic. The former frequently improves following simple exploration, whereas the plastic type is not improved by any surgical procedure. In the latter type there frequently are palpable masses, which in the presence of fluid makes them movable, not unlike carcinomatous masses in advanced metastasis associated with fluid. The differential diagnosis between tbese two conditions is often difficult if not impossible, especially in the absence of cachexia. I have seen the entire small intestinal tract in tubercular plastic peritonitis matted into a single obstructing mass taken for carcinoma.

Drainage in serous tuberculous peritonitis not only fails to do any good, but exposes the patient to the risk of a permanent fistula. Serous tuberculous peritonitis if operated early, and especially in children, promises a cure; while late operation too often finds the two conditions—a plastic added to the serous tuberculosis It has been my experience that some good is gained by giving Koch's old tuberculin hypodermically in small doses. This combined with cod-liver oil and fresh air can accomplish a great deal.

In local plastic tuberculous peritonitis, involving the terminal ileum and cecum with intermittent pain, generally paroxysmal, I advise opening the abdomen to satisfy myself of the extent of the pathology and with the hope of making either a resection, which is only occasionally possible owing to the poor general condition of the patient, or, what is more often feasible, an ileocolostomy, and sometimes an additional entero-enterostomy. I have seen relief after one or other of these operations, more often the last mentioned, and life prolonged and rendered comfortable. In early tuberculosis of the cecum operation should be made without any hesitation. I am glad to have had tbe opportunity of operating this condition before you, as it has offered the occasion for expressing myself in favor of surgery in many cases where medical treatment accomplisbes practically nothing

BLADDER AND PROSTATE

We have 2 patients for prostatectomy The first is an obese man aged sixty complaining of frequency and attacks of hem aturia and pyuria of four months duration His blood urea is 13 mg per 100 c c and the phthalein elimination 60 per cent in three hours Cystoscopic examination showed moderate enlargement of the prostate and the presence of a vesical cal culus Litholapaxy was tried but was unsuccessful so I am now going to open the bladder under spinal anesthesia Here is a stone the size of a hickory nut I have now enucleated the prostate and packed the fossa with iodoform gauze The blad der is closed around gauze and a large drainage tube which has been placed in the bladder and a smaller rubber-dam in the prevesical space The gauze and rubber dam will be removed on the third and fourth days the bladder tubes reduced in size, and removed when the urine becomes clear

The patient was discharged in good condition on the thirty first day

The second patient, aged seventy one has had frequency and urgency for the past year Seven days ago he had acute urinary retention since which time he has required catheterization three times a day His general health is good Blood pressure, sys tolic 160 diastolic 100 Examination reveals emphysema and heart sounds of poor quality Rectal examination shows uniform enlargement of the prostate The blood urea is 13, and the blood sugar 140 mgm per 100 c c Urine analysis shows a small amount of albumin and a few casts The phthalein elim ination is 50 per cent

Under spinal (apothesine) anesthesia I open the bladder through a low right rectus incision A small calculus is removed and a small, hard prostate is enucleated The bladder is closed around a rubber tube and a small tube placed in the prevesical space The patient s condition is not very good so we will give him an intravenous infusion of normal saline

We regard the preoperative treatment as the most impor tant part of the management of prostatics When possible we

use the permanent indwelling catheter or intermittent catheterization until there has been sufficient improvement in renal function and in the general condition of the patient to warrant operation. The time required may be from several weeks to several months. It is our practice to cystoscope every case, if possible, to determine the presence of complicating lesions, such as diverticula, calculus, and carcinoma.

We expose and open the bladder for inspection through a low right rectus incision. When we find the bladder mucosa thickened by edema and inflammation, with marked congestion and sometimes ulceration, we stop here by making a cystostomy and remove the prostate later when conditions are more favorable. In most cases we can safely remove the prostate in one stage. We use a gauze pack in the prostatic bed only when there is persistent oozing which cannot be controlled by suture and hot moist temporary packs. We never employ the hemostatic bag or other contrivances. The bladder is drained suprapubically by a large tube. When the sinus is slow to close we put in a urethral catheter. Following removal of the fibrous type of prostate it is sometimes necessary to pass sounds to prevent narrowing of the posterior urethra.

When the prostatic bed has not been packed, it is well to remember that bleeding can be excited by purgation or enemas. Secondary bleeding, which is very rare, is best controlled by packing the prostate bed. We are not obsessed with the idea that the patient should be gotten out of bed the day following operation. In short, these cases are treated as are most of our surgical cases. To rush the patient out of bed immediately after a serious operation is a surgical fancy.

During the day after operation, in this case, the drainage was only 270 c.c. The pulse was irregular and the patient was drowsy. Fluid intake was increased by hypodermoclysis and proctoclysis. His condition did not improve and he died on the third day.

At autopsy it was found that both kidneys were of a large white type and the right one contained a cyst one-fourth the size of the kidney.

The next patient I present is one of a class of which I regret to say we see many—carcinoma or papilloma of the bladder We remove the growth by excision (especially the pedunculated papilloma is excised) or cauterization or by combining the two We don t fulgurate and we don t cut edges except with the cautery In the benign papilloma there is no occasion for this We (that means me and my colleague Dr McKinney who makes all of these diagnoses) believe that a man or woman coming in with a history of bloody urine should be cystoscoped as soon as possible What is the use of wasting time? What is the use of examining the urine and not knowing whether the blood comes from the bladder the kidneys or the ureter? The expert cystoscopist can tell at a glance whether the lesion is in the bladder the kidneys or the prostate with oozing of the large veins over the prostate or whether it is an obstruction or a urinary tuberculosis We are often confronted with the picture of pyelitis which a very good doctor has diagnosed appendicitis We don t know positively until the patient is cystoscoped and the report comes back—pyelitis I had a patient brought here the other day from a doctor who had made a diagnosis of a perforated appendix I saw the patient at once felt the abdomen but said nothing When she was brought in her respirations were 42 with a history of chill and there was abdominal rigidity and tenderness I said Let us wait until tomorrow If she hadn t had the chill the high temperature and a very high leukocyte count I would have cut her but I did not My intern came along and asked What is the matter with this patient? I said Pneumonia We opened the windows gave her medication and today she is all right

We are giving spinal anesthesia in this case The only ill effects we see from it are occasionally depression and vomiting during the operation Once in a long while when the patient has a low blood pressure and the pulse is very weak we give 1000 to 1500 c c salt solution intravenously But intraspinal anesthesia should be given only where it is strongly indicated or where there are contraindications for other forms of anesthesia If we were experts in giving parasacral anesthesia we should

prefer it perhaps, and should do it here regularly Every week in the year, however, we average 75 to 80 or more operations If we had to give a parasacral or paravertebral anesthesia on every occasion, we should have to ask the Lord to make a good many more hours in the day and weeks in the year A parasacral anesthesia requires at least half an hour We sometimes do 26 operations in a day and if we were to multiply this by thirty minutes each we would have thirteen hours for anesthesia alone so that it is out of the question This is however, no reason for not doing it provided it is best for the patient We wish we had enough help and enough experts to give it to them all

This patient is a man fifty seven years old admitted to the hospital October 19th, nine days ago, complaining of dysuria, frequency, urgency and hematuria In January, 1925 he began to have pain on urination The pain is burning and at times severe In February he began to pass blood with his urine, associated with frequency and urgency, getting up as many as eighteen times a night In the past eight months he has lost 21 pounds Abdominal examination is negative the prostate is slightly enlarged, and the posterior wall of the bladder is indurated Doctor, what is the cystoscopic diagnosis?

DOCTOR Large, irregular, papillary carcinoma on the right lateral wall of the bladder

I carry the incision over the extreme lower portion of the right rectus muscle close to the median line dividing the skin, superficial fascia and anterior sheath of the muscle and with the end of the handle of the knife separate the fibers of the muscle exposing the transversalis fascia, which I incise thus bringing into view the preperitoneal fat which in the extreme lower end of the wound is present in the shape of prevesical fat containing a number of veins—the prevesical veins I next place three retractors two laterally and one at the upper end of the wound Beneath the end of the upper retractor I place a small moist gauze sponge so that when traction is made the prevesical fatty tissue will be rendered tense, which makes it easier to cut

through to expose the bladder wall The cut veins are tied I don't scratch through the prevesical fat with the point of the finger, but cut it away with the knife This tissue is easily traumatized, and such trauma may result in a prevesical suppu

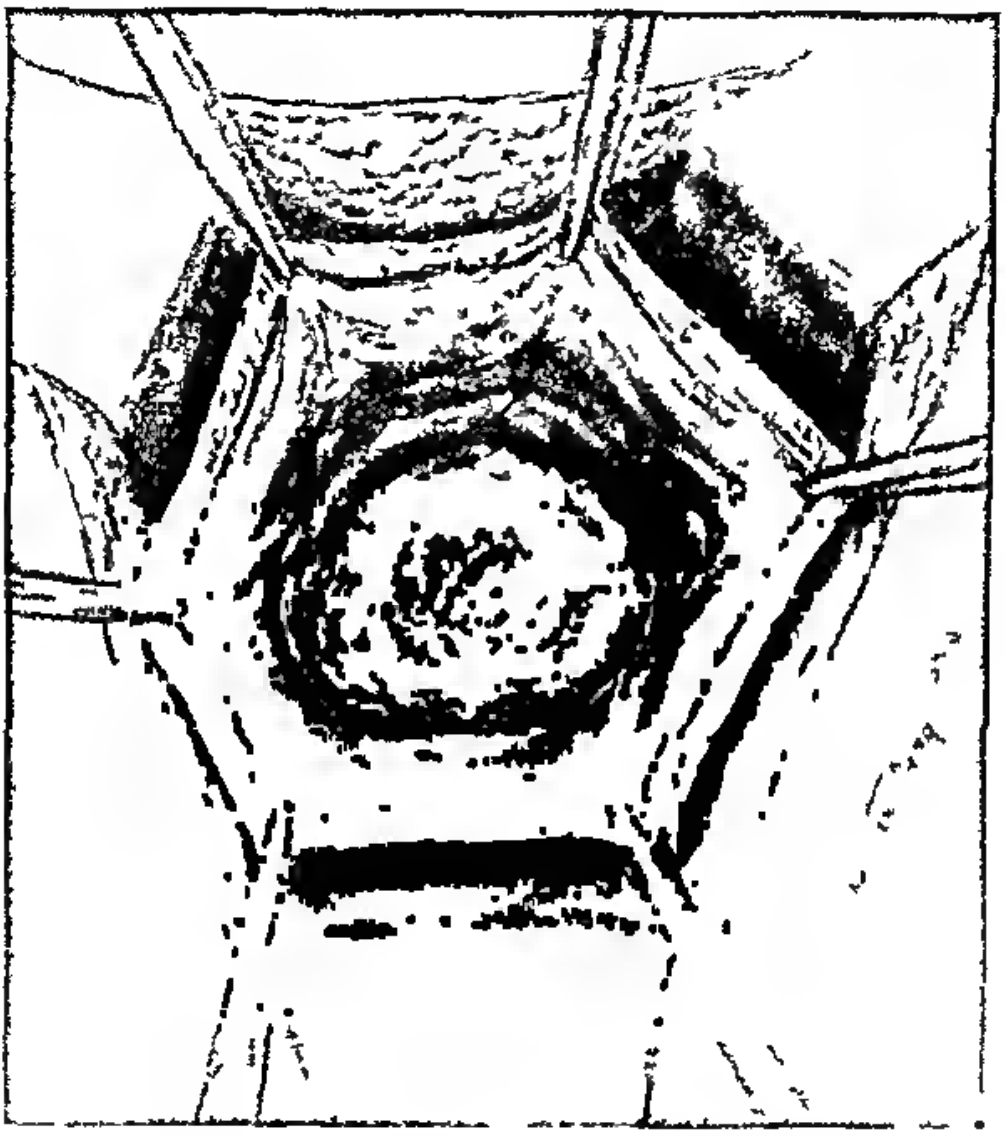

Fig 538 —Bladder opened showing carcinomatous mass at the base and on the posterior wall of the bladder

ration and abscess The bladder wall being exposed, I grasp it with two Allis forceps and incise between the forceps Before releasing the forceps I carry two retractors into the bladder and retract the bladder wound This allows me, after mopping with small gauze sponges, to expose and show you the growth I

destroy the growth by cauterizing it thoroughly, as you see The operation is completed by introducing a large rubber tube into the bladder and closing the bladder placing a piece of rubber-dam in the prevesical space and closing the external wound There was perhaps a time when this was a benign papilloma, but it is now in a very bad condition In our experience we have had a number of these cases who are doing well, notwithstanding the fact that they have a bad form of malignancy They have been followed up by frequent cystoscopy and touching up with elec tric cautery, and they have lived for years I have one patient, a woman past middle life, from whom I removed both breasts for carcinoma She returned later with bloody urine, and I sent her to Dr Mackinney, who said she had bloody urine from the bladder I operated on her and she is well today, although this was five or six years ago This was early recognition I repeat, the first drop of bloody urine should be investigated Don't give the patient urotropin and acid phosphate and believe it is going to do any good It is only a deception, it merely neu tralizes the urine and modifies the frequency It will not cure

QUESTION What do you think of radium?

ANSWER What do I think of radium? That it is not worth being tried in these cases You can put in 20 30, or 40 needles of radium, and the man will die of carcinoma just the same

Where these growths do not infiltrate and are situated away from the ureter, we can occasionally do a resection of the bladder and close the bladder Someone has asked about the ureter I transplant the ureter rather than tie it off By tying it off you sometimes make the operative risk more serious than the dis ease, and certainly shorten the life of the patient if the opera tion is not a success

The microscopic report of this case reads carcinoma simplex

The patient is still in the hospital at the time of this report and is doing well

The next patient is a physician, aged sixty three, who has had hematuria on two occasions during the past month Cystoscopic examination showed a small sessile papilloma on the left wall of

the bladder His abdomen is very obese Under gas anesthesia I have opened the bladder and exposed a papilloma low down on the left wall which I thoroughly destroy by cauterization I place a large tube in the bladder and close the bladder in the usual manner around the tube

The patient is still in the house and doing well

The next 2 patients for operation have vesical calculi

The first patient a man aged sixty seven complains of dysuria urgency and frequency of one year's duration On several occasions he has had retention and required catheterization His prostate is hard regular smooth and does not seem to be enlarged

Operation under spinal anesthesia Stone removed by suprapubic cystostomy The bladder shows a marked degree of cystitis The prostate is not enlarged The bladder is closed around a drainage-tube which will be left in until the cystitis clears up

The patient is still in the house

The second patient a man aged sixty eight for the past eighteen months has had dysuria urgency frequency and has worn a urinal for six months because of incontinence His prostate is uniformly enlarged His renal function tests are fairly good Cystoscopic examination shows a large stone in the bladder

Operation under spinal anesthesia Bladder opened and stone the size of a walnut removed Nothing was done to the prostate The bladder was closed without drainage A small rubber tube was placed in the prevesical space

The patient was discharged on the twenty fourth day

In both of these cases I believe the symptoms were caused entirely by the stones I do not remove the prostate unless it is causing obstruction or there is residual urine In cases where I find a projecting middle lobe which is more or less pedunculated and the evident cause of obstruction I merely excise this lobe without removing the prostate

EXOPHTHALMIC GOITER

A paperhanger, aged forty five, complains of nervousness, loss of weight palpitation, and prominence of the eyes The onset of symptoms began one year ago following an attack of la grippe He has lost 76 pounds and his condition has become progressively worse

Systolic blood pressure is 156, diastolic 70 He is very ner vous, has a tremor and exophthalmos and there is visible pulsation of the veins of the neck There is slight uniform enlargement of the thyroid The basal metabolic rate at present is plus 10 The *x* rav of the chest is negative for substernal goiter

It is our practice, as is that of the majority of surgeons doing goiter work, to give Lugol's solution for hyperplastic goiter both before and after operation, and we have found it a great help The administration of Lugol's solution has largely taken the place of preliminary ligation The time to perform the opera tion is in the quiescent period before the ascending wave of hyperthyroidism is established

The amount of gland to be removed depends on the size of the goiter and the condition of the patient during operation By preserving the gland tissue in the posterior part of the lateral lobe one not only avoids injury to the recurrent laryngeal nerve but also guards against postoperative hypothyroidism Cases which develop myxedema after the present day operation for goiter frequently do so not because too much gland has been re moved, but rather as the result of wound infection which has destroyed the remaining glandular tissue

You have observed the position in which we place the patient for a goiter operation—Trendelenburg position, head dropped, and neck arched by placing a sand pillow beneath shoulders The size of the pillow depends upon the size of the patient—a comparatively small one suffices for the thin patient, with a large one for the fat patient This position also allows the on lookers to see and follow the steps of the operation Under gas oxygen anesthesia, morphin and atropin having been given two hours and a half an hour, respectively, before the operation, I

resect the right lobe of the thyroid The collar incision is made through the skin and superficial layer of the superficial fascia as low down as possible, now with care the flap is dissected up as high as the upper border of the thyroid cartilage, leaving intact the platysma muscle and the anterior jugular veins The platysma muscle and the superficial layer of the deep cervical fascia are incised vertically and over the prethyroidal muscles (depressors of the hyoid bone and larynx) when the edges of the wound are grasped with Allis' forceps and retracted laterally exposing the thyroid gland covered by its connective-tissue capsule (surgical capsule of the thyroid) This opens the musculocapsular space into which the point of the finger (or fingers) is introduced and by careful manipulation the respective half of the gland is dislodged bringing it out of the deep portion of the wound, the vessels are then ligated and the lobe removed in its entirety or what is better, the extreme posterior part of the lobe is left occupying the deep portion of the space by carrying a lateral incision through the lobe thus avoiding injury to the recurrent laryngeal nerve If both lateral lobes are removed the same technic is followed for the removal of the opposite lobe The musculocapsular space or spaces are drained with pieces of rubber-dam and closed by suturing the muscle sheath and the skin wound is then closed

The pathologic report on the specimen was hyperplastic goiter with the presence of colloid

The patient developed bronchopneumonia of the right lobe on the fifth day but made a good recovery and was discharged on the fifteenth day

In very large hyperplastic goiters the operation consists of dividing the sternomastoid and the prethyroidal muscles between clamps and retracting the respective muscular flaps upward and downward

In the case of the single adenoma or isolated cyst simple enucleation of either is the procedure of choice The non toxic cystic goiter is readily removed by the operation I have made on this patient

CARCINOMA OF THE STOMACH

This man, aged fifty nine, complains of nausea, vomiting, epigastric distress, and loss of weight of ten months' duration He is emaciated, slightly jaundiced, and there is tenderness and rigidity in the epigastrium, but no definite mass The liver is large, but smooth The hemoglobin is 90 per cent —characteristic of dehydration *x* Ray examination shows extensive carcinoma involving the middle third of the stomach with sufficient freedom in the upper third to warrant exploration I open the abdomen under nitrous oxid anesthesia There is a very large mass present, and I can feel metastatic nodules in the transverse mesocolon There is no use in doing subtotal gastrectomy here because of the metastasis The stomach is very large and hypertrophied I shall make a posterior gastro enterostomy to relieve the vomiting I generally prefer to let these late cases alone, but gastro enterostomy does afford a little relief The gall bladder is distended and diseased We might as well make the patient as comfortable as possible, so I shall remove it A rubber tube is placed in the subhepatic fossa

The pathologist reports chronic cholecystitis with acute exacerbation

The patient recovered from the operation and left the hospital on the fifteenth day

Clinically, we see two types of carcinoma of the stomach The one has a relatively long history of indigestion and symptoms characteristic of ulcer, which later change to a syndrome which we recognize as typical of cancer of the stomach The other type begins insidiously with vague symptoms of indigestion and epigastric distress, and is rapidly progressive Unfortunately cancer of the stomach does not cause irritation and is usually not recognized until a palpable tumor, obstructive vomiting and emaciation supervene Carcinoma of the antrum and of the pylorus manifests itself early because of the obstruction produced, and is the most favorable for operation The relation of ulcer to cancer is a moot question No doubt many ulcers are carcinomatous from the start Carcinoma cells have frequently been found in the growing edge of an ulcer, but absolute proof,

Fig 539.—Showing metastatic mass in transverse mesocolon Insert shows area of stomach involved by carcinoma

that is change from benign to malignant ulcer has never been observed We must rely on clinical experience for our belief hat this change takes place in a certain percentage of cases

I rarely do a two-stage operation for carcinoma of the stomach when there is a technical possibility of removing the tumor by subtotal gastrectomy in one stage Occasionally we find a large inflammatory mass densely adherent to the pancreas and surrounding structures, and it is impossible to be sure whether it is ulcer or cancer If gastro-enterostomy can be made proximal

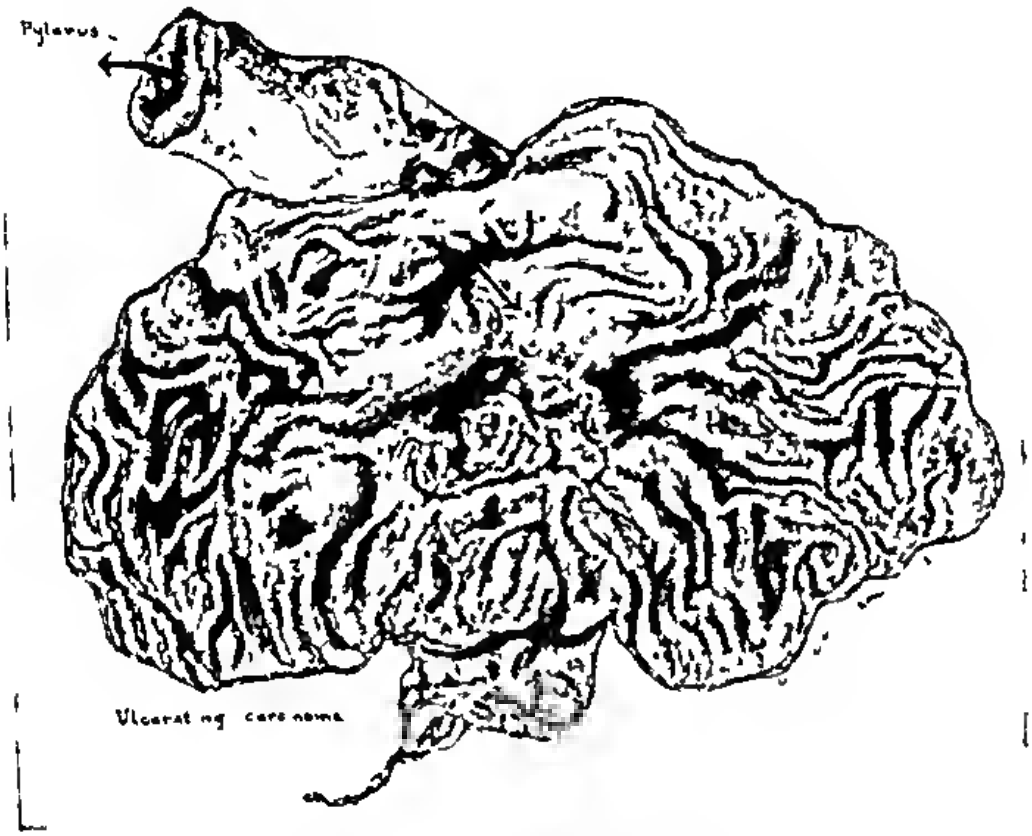

Fig 540—Ulcerating carcinoma of the stomach on lesser curvature One-stage operation

to the tumor the inflammation sometimes subsides, so that the second stage can be done later

I now wish to present 4 ulcer cases from our follow-up service

J B , subtotal gastrectomy for gastric ulcer He was operated on three years ago He is still gaining in weight His appetite and digestion are good His bowels are regular. His appearance is very good With gastric ulcers I am very radical.

With duodenal ulcers I am not so radical It is in gastric ulcer that you have about 40 per cent of the cases developing carcinoma This patient s gastro enterostomy is working well

H B a case of duodenal ulcer where the ulcer was about to perforate He came in with the history of eight years digestive disturbance associated with sour eructations At operation December 11 1922 the induration at the site of the ulcer was extensive The stomach was pushed up and the necrosed tissue broke away badly A pylorectomy and appendectomy were done He was followed up for twelve months during which time he was fairly well but at the end of that time he developed symptoms of marginal ulcer for which he was operated eighteen months after the original operation that is to say May 23 1924 At this time the ulcer was excised and a Roux Y operation performed Five months later he returned to the clinic in not very good condition An *x* ray showed that the stomach was emptying too quickly through a greatly distended opening On account of this distention no positive evidence of ulcer could be gained He was readmitted to the hospital January 31 1925 with decided symptoms of marginal ulcer and although all tests were favorable for operation the patient improved while in the hospital and decided to postpone the operation until another time

Mr S aged seventy two subtotal gastrectomy posterior gastrojejunostomy for perforated gastric ulcer September 1921 He has come back many times since operation with a clear record straight through

About 3 per cent of our peptic ulcer cases develop marginal ulcers We are convinced that they are more apt to occur in cases that had a very high acidity before operation and for that reason we believe that acidity has much to do with the formation of ulcer This patient s ulcer was found on the lesser curvature near the pylorus with an indurated base $2\frac{1}{2}$ cm in diameter He is now seventy six years of age says he

feels fine, and that he can eat and drink everything but scrapple mackerel and seltzer

R D Operated on two years ago for carcinoma of the stomach He is sixty seven years of age At the time of operation he weighed 98 pounds After operation his weight went up to 124 pounds Two months ago he was hit in the back, following which he lost 14 pounds and since which time he has been unable to work He feels well otherwise

The patient at the cancer age, with indigestion and negative palpable findings, should not be treated medically for longer than a month or two if improvement is not pronounced, but should be x rayed, when, if a lesion is found, operation should be advised If no lesion is detected, better open the abdomen and explore Were this practice universally followed the prognosis of cancer of the stomach would be more promising

CARCINOMA OF THE BREAST

This woman, aged fifty five, injured her left breast three months ago, since which time she has noticed a movable lump which has increased in size until now it is as large as a lemon It occupies the lower left lateral quadrant of the breast, and the overlying skin has a 'pig skin" appearance There are no palpable glands in the axilla Under gas anesthesia I remove the left breast and all of the deep pectoral fascia, but not the muscles The axilla is cleaned out, the removed glands show metastasis

The pathologist's report is carcinoma with glandular involvement The patient was discharged on the fifteenth day

In our experience when the axillary glands are involved there are usually more distant metastases beyond our reach, so that the operation becomes a palliative one, and that is my reason for not removing the pectoral muscles Murphy believed that the muscles were not involved by metastasis, and he, therefore, did not advocate their removal Subsequent study has shown this assumption to be incorrect The most radical operation,

including wide excision of the tumor with the fascia, muscles, and axillary tissue, is especially indicated in the early case because with this plan the prospects of cure are very good Clinically carcinoma of the breast exhibits varying degrees of malignancy depending on the type and location of the growth the age, and individual resistance of the patient Some growths such as the scirrhous tumor, may exist for years without causing metastasis, while in other types the malignancy is so great almost from the start that the efforts of the surgeon are of no avail Carcinoma of the breast has a particularly bad prognosis in the young female and in the male patient Local recurrence usually within a year means that the operation was incomplete, while distant metastasis to bone often occurs late Handley has shown that the reason for removing the upper portion of the rectus sheath is to prevent metastasis to the liver by way of the suspensory ligament

Every breast tumor should be removed as soon as it is discovered In doubtful cases gross examination of the excised tumor usually reveals its true character

The subject of *x* ray treatment both before and after operation is often discussed It is our practice to use it after operation, but rarely before operation I think it is perhaps better to leave this to the judgment of the expert roentgenologist who has had much experience in *x* ray therapy

The pre and postoperative treatment by *x* ray is the practice I dare say of most surgeons, to which I cannot take exception The rationale of the treatment, as you know, is coffer damming the lymphatics and heading off metastasis Radium in this respect cannot accomplish what the *x* ray can as radium only radiates a comparatively short distance from where it is applied, while the *x* ray can be given over a large area Radium is like a hand light, while the *x* ray is like a searchlight

In the radical operation for carcinoma of the breast the dissection starts in the apex of the axilla, and is carried downward and medialward, working against the course of the lymph current, this makes diffusion or dissemination of the cancer cells less likely than when dissecting from within lateralward and

from below upward In the dissection from above downward the blood-vessels are tied at their origin, therefore there is less bleeding in the latter part of the dissection Formerly, the breast was removed first, now, in the radical operation, it is removed last As I have already stated, the radical operation accomplishes most in the early cases before metastasis has taken place After metastasis has occurred its usefulness is limited In early carcinoma operation cannot be too extensive, while in late carcinoma it can be I urge you to follow this practice The distinguished English surgeon, Handley, by his work in the study of the lymphatics, has given to the profession a message that has resulted in untold good in connection with surgery of the breast.

It is my practice to drain all these cases and dress the wound with the arm at right angles to the body After two or three days there is no restriction placed upon the patient's using the arm as much as she comfortably can

Other conditions of the breast for which operation is indicated are fibro adenoma, fibrocystic adenoma, intraductal papilloma, Paget's disease, diffuse chronic mastitis, circumscribed involutionary changes, and sometimes abscess We sometimes see extensive abscess of the breast which has received multiple incisions without controlling the spread of the infection and in those instances removal of the breast is often the better procedure We often find that abscesses fail to heal because they have not been opened wide enough Free incision should be made throughout the long axis of the abscess and every pocket laid open and the wound packed, which means it should be allowed to heal by granulation

ASCITES

This man, aged fifty two, was admitted to the hospital complaining of headache Examination revealed marked enlargement of the liver and spleen together with ascites Blood urea was 20, and blood sugar 114 mgm per 100 c c The Wassermann test was strongly positive

I have been asked by my medical colleague to do an explor-

atory operation which I am very glad to do Upon opening the abdomen there is immediately seen free ascitic fluid, the surplus portion of which we will allow to escape when we are able to make an examination of the viscera The liver is much enlarged also the spleen This looks like a case of portal cirrhosis, however his Wassermann test was strongly positive

He will be returned to the medical side of the hospital where he will doubtless be tapped from time to time, thus making him as comfortable as can be He will probably be given a trial of specific treatment, but I think the case is too far advanced for medicine or surgery to accomplish much These cases often have associated splenomegaly and sometimes are relieved by removal of the spleen combined with the Talma Morrison operation Ascites also occurs in biliary cirrhosis, syphilis of the liver, and advanced Banti s disease It is seen occasionally in advanced cardiac decompensation, and in nephritis it is a part of the edema and serous effusion

CARCINOMA OF SIGMOID

Female aged fifty four who has had attacks of diarrhea for one year and has frequently noticed blood in the stools During this time she has been treated for hemorrhoids She has lost 35 pounds feels weak and has a cachectic appearance A mass can be felt by high rectal palpation Under spinal (apothesine) anesthesia the abdomen is opened through a low rectus incision The liver is negative for metastasis There is a large carcinoma of the terminal sigmoid and first portion of the rectum (recto sigmoid) as you can see, is very friable and has ruptured during the manipulation in the attempt to deliver it The tumor is resected The outer leaflet of the mesosigmoid is incised the sigmoid with the upper rectum rotated to the right, when the vessels especially the middle hemorrhoidal, are cut and ligated The proximal end is closed a purse-string suture placed, and the end invaginated and the purse-string tied In addition, reinforcing interrupted sutures are placed better to guard against leakage The bowel is now returned to the abdominal cavity

and covered with a hot moist pad of gauze, the distal end of the bowel is closed in the same manner as the proximal end. I now dissect the posterior parietal peritoneum down to behind the bladder, push the end of the distal bowel well down and replace and suture the reflected posterior parietal peritoneum.

Fig. 541.—Carcinoma of sigmoid

The proximal end of bowel is anchored in the wound, to be opened later, thus making an artificial anus. A cigarette drain placed in the pelvis, the gauze pads are removed and counted, and the wound closed. If the patient recovers from this operation, the lower rectum will be removed through the perineum later. In our experience this is a satisfactory and usually a successful

operation yet I am doubtful about the outcome in this case as the patient s condition is very bad The removal of the rectum at the end of ten days or two weeks is a comparatively easy procedure In the far advanced cases if the growth is fixed and perhaps involving the bladder or the uterus with much surrounding exudate I rarely do more than a colostomy The work Coffey is doing in transplanting the ureters etc has made surgeons more bold in dealing with rectal cancer and rightly so

The pathologist s report (frozen section) reads Adenocarcinoma with metastasis

The second patient is a teacher aged thirty eight who has had constipation for some time Seven days ago she began to have cramps and has had no bowel movement for four days even with the help of purgatives and enemas She is able to pass a little gas and has vomited once She is thin and we note that the abdomen is markedly distended Rectal examination is negative

We believe this girl has an obstruction in her descending colon This is an emergency case because of the intestinal obstruction distention and vomiting

As for clinical regard to examination I have found that the most reliable instruments we have for examination are touch sight hearing taste and smell and I find them far more valuable than the x ray Many doctors practice a lifetime without acquiring a true sense of touch yet it is something the surgeon must have as the skilled nurse must have it and the skilled portrait painter The value of sight and touch is that they teach us how to examine a patient As I sat beside this girl s bed this morning I could see a little movement that I thought was a peristaltic wave I could see the cecum as I thought rising up and down The abdomen did not present the ladder rung appearance nor was pain excited by palpating the abdomen I am going to do what Crile would call a decompression in other words a cecostomy and if there is an intestinal obstruction I shall attack it later I may pass a hand across to see if

there is a growth in the descending colon or sigmoid The patient is young but she may have such a growth We have seen a number at her age

When examining the rectum I rarely, if ever, put in a proctoscope because I believe the diagnosis can be made without it Unless the proctoscope is used with great care there is danger of its being pushed through the walls of the bowel into the peritoneal cavity This operation is often done as a preliminary procedure, but sometimes is left as a permanent affair but as has been said, in the present case it is best to consider it a preliminary step You can see the distended cecum There is so much distention here that I hesitate to pass my hand to the opposite side of the abdomen, being afraid I shall do damage There is an early peritonitis present Notice the presence of serum Because the cecum is distended we know the obstruction is beyond, not proximal to it

I am not going to do an appendicostomy Such a procedure would not help But I shall do a cecostomy Here is the cecum All it needs is a little opening We will seal this off with the cautery and shall open it later This will give her the needed relief When this belly loses its distention and the peritoneum gains normalcy, we can do the second operation Of course, we will make the second operation on the other side, because the obstruction is distal to the ascending colon certainly distal to the cecum My experience is that these peritoneal fistulæ, after restoration of the normal fecal current has been brought about will close spontaneously provided there is *no eversion of the mucous membrane* The fistulæ most apt to close spontaneously are those having a circuitous course and in which the opening in the bowel is distal to the surface

This procedure in this young woman has been the first stage of a decompression, if you like done to relieve or take away the tension when the opening is made Decompression is a term usually applied to the brain to relieve tension We shall give this patient a little morphin to keep her peristalsis controlled otherwise since she has been having hyperperistalsis in an attempt to force the obstruction she may tear away the

union that we have made and the one nature will make in the course of a few hours If this patient during the course of the next twelve hours or during the night balloons up or vomits or the distention increases we may open the cecum sooner than we otherwise would

The cecum was opened two days later The patient s condition steadily improved

Seventeen days later under spinal (apothesine) anesthesia the abdomen was opened through a left rectus incision and an annular carcinoma of the sigmoid was found causing the obstruction The growth with 3 inches of healthy bowel on both sides was resected and a lateral anastomosis made

Twelve days later at the time of this report the patient was making a good recovery

Many of these cases come to the surgeon late because they have been treated for piles In the first case we did not make a proctoscopic examination because the diagnosis was obvious In the majority of cases of cancer of the lower sigmoid the diagnosis can he made from the history and by digital examination It is only rarely that one cannot feel the growth in the terminal sigmoid unless the patient is very fat We turn the patient on the left side flex the chest strongly upon the abdomen and flex the trunk on the pelvis thus buckling the patient With the left hand over the lower abdomen and the finger of the right hand in the rectum you can carry the perineum well up and usually feel the rectosigmoid

In the operation the first thing to do after opening the abdomen is to examine the liver for metastasis which if present forbids radical operation only a colostomy can be made

In the presence of acute obstruction it is not the part of wisdom to do a radical operation in one stage but to divide it into two or more stages When the growth can be mobilized and lifted out of the abdomen as in the presence of a growth laterally placed in a long sigmoid the Mikulicz type of operation can be made The one stage operation is a good procedure when there is no acute obstruction When possible we prefer to resect the growth close both ends of the bowel being careful

not to invaginate fat between the layers of serosa and make a lateral anastomosis We feel that this type of anastomosis is much safer in the large bowel than end to end union, hut we frequently are compelled to do the latter

SPLENECTOMY

This woman, aged thirty seven, seems to have Banti's disease She has lost 30 pounds in three months and complains of occasional pain in the epigastrium and distress in the left chest and left shoulder, and has had indigestion for many years—Banti s dyspepsia There is evident enlargement of tbe spleen and of the liver which can be felt four fingerbreadths below the costal margins She has had a tinge of jaundice for the past week.

Examination of the blood reveals anemia and excludes leukemia Tbe routine laboratory tests are negative The coagulation time is two minutes, five seconds We find the liver markedly enlarged and granular The spleen is enlarged and surrounded by many adhesions splenectomy and appendectomy are performed, and a glass tube placed under the diaphragm

The pathologist's report is sago spleen and Banti's disease

The glass tube was removed on the second day Recovery was uneventful and the patient left the hospital on tbe seventeenth day

The second patient is a man aged twenty nine on whom we operated three months ago, excising a duodenal ulcer and making a posterior gastro enterostomy He was free of symptoms until two weeks ago, when be began to have epigastric pain and regurgitation of sour material The laboratory tests and Roentgen ray examination of the stomach are negative Upon opening the abdomen under spinal anesthesia we find no lesion in the stomach or about the gastro enterostomy opening The gall-bladder is adherent to the duodenum and the spleen is enlarged Cholecystectomy and splenectomy are performed A glass tube is placed in the subhepatic fossa

The pathologist reported chronic interstitial splenitis and chronic cholecystitis

The patient recovered and left the hospital on the fourteenth day

In surgery of the spleen in traumatic cases the best incision is high through the left rectus because it permits examination of the other viscera The left rectus muscle should be divided transversely if there is difficulty in exploring a spleen fixed by adhesions In other cases an incision through the left semilunar line continued up to the costal margin and ensiform cartilage gives the easiest access to the spleen Control of bleeding is most important especially in the separation of adhesions which may be dense and strong They are usually most numerous between the diaphragm and the upper pole of the spleen although omental adhesions are not uncommon When separating strong adhesions the spleen capsule and underlying substances are likely to give way The splenic region is exposed by retraction of the wound and the proper placing of gauze pads the spleen is teased out very gently because the pulp is soft and friable The walls of the veins may be thin or calcareous and tear readily As the spleen is mobilized hot moist pads are pressed into the splenic cavity to control oozing Moreover the heat of these pads against the solar plexus stimulates the splanchnic nerves and thus lessens shock

In cases in which the spleen is not too large its pedicle can be exposed from the front after drawing the stomach far to the right and dividing the gastrosplenic omentum containing the vasa brevia to the stomach and the left gastro-epiploic vessels Occasionally the left gastro epiploic arises from the splenic artery sufficiently proximal to the entrance of the latter into the spleen to render its division unnecessary

In most cases the vessels in the pedicle can be more easily reached after the spleen is turned over but this is not possible until the adhesions are broken and the lienophrenic fold of peritoneum divided These adhesions may be dense and may contain large veins which are easily ruptured so that it is well whenever possible to divide them between clamps and to pack hot moist pads into the bed from which the spleen has been raised When the spleen has been freed the hand is introduced

between it and the diaphragm, the organ drawn down into the wound, turned over and the vessels in the pedicle isolated by blunt dissection These are then secured by two large clamps and the spleen cut away There must be enough tissue left in the pedicle to allow application of the ligatures, and whenever possible, each vessel that can be identified should be ligated separately as it projects from the clamps on the divided pedicle Two ligatures are placed on the pedicle as the clamps are removed Any accessory spleen should be removed The packs are removed and any bleeding is controlled by suture and ligature Persistent oozing may be controlled by a pack brought out through the lower angle of the incision or through a stab wound As a measure of safety a glass drainage tube may be inserted under the diaphragm and left in for ten or twelve hours The patient will be told that there is a glass tube in her abdomen and cautioned to be as quiet as possible

QUESTION Is she not likely to break the tube?

ANSWER I have used it hundreds and hundreds of times and have never known it to break Of course, the nurse is ever watchful, always on her toes I could slip a rubber tube down, but the glass tube is much more satisfactory

Banti described three stages of this disease simple enlargement of the spleen, enlargement with secondary anemia and cirrhosis of the liver with splenomegaly

In the first stage the uniform enlargement of the spleen is the only finding, and may be present for three to five years before the onset of the symptoms of anemia which mark the beginning of the second stage At this period the liver begins to enlarge and gastro intestinal hemorrhages result from congestion of the splenic vein With the onset of the third stage the liver decreases in size and ascites develops

Splenectomy is the only rational treatment, and good results may be expected in the early stages

Occasionally syphilis is seen in connection with Banti s disease, and, if so, does not necessarily forbid operation Some years ago when conducting an operative clinic in Buffalo one of the cases presented for my opinion was one of Banti's disease

with ascites and syphilis To the surprise of many of those present I operated removing the spleen The patient convalesced nicely and within a comparatively short time resumed his occupation as motorman on the street car line

Splenectomy from the operative standpoint is one of the most satisfactory operations in that it is simple to perform in the absence of extensive and dense adhesions In the presence of the latter great care and gentleness of manipulation with good exposure and packing the splenic cavity with gauze pads enables the surgeon to be master of the situation I have on a few occasions left the packs in for ten days with good results

In the absence of extensive and dense adhesions the operation itself presents no great difficulty Early recognition followed by immediate operation is the *sine qua non* for the possibility of a cure it is therefore better for the patient when he first complains to fall into the hands of the surgeon than the medical man May I not say that this is true of most if not all of the conditions for which splenectomy offers the only cure Late pathology gives the surgeon trials and tribulations and makes what should have been an operation attended with little if any danger a dangerous one

Conditions for which splenectomy should be made are

1 Hemolytic icterus
2 Splenic anemia
3 Purpura hæmorrhagica
4 Traumatic rupture of the spleen

A number of spleens have been removed for echinococcus disease In some instances syphilis is complicated by splenomegaly and the progress of the disease can be controlled by removal of the spleen The results of splenectomy for pernicious anemia and leukemia only occasionally seem to justify the procedure

APPENDICITIS

Twelve cases of appendicitis were operated 6 of which were of the chronic and 6 of the acute variety In 3 of the acute cases the appendix was gangrenous 2 of which had per

forated at the base, with free pus in the abdomen and pelvis In the remaining 3 cases the appendix was acutely inflamed with free purulent fluid in the abdomen

Pus, not mere puruloid fluid, is frequently seen in non perforative acute appendicitis caused by the infecting micro organisms penetrating the unbroken walls of the appendix

Strange to say, the question of when to operate in acute appendicitis is still debatable My experience has taught me to operate at the earliest possible moment, irrespective of whether or not the white blood count is normal, provided, of course that the peritonitis, if present, is not forbidding Operation immediately after onset of an acute attack, before the local irritation has developed into peritonitis really makes the operation equivalent to an interval operation, the risk of which is practically *nil* While it is true that we have an occasional death after an interval operation as a rule unless this is due to cardiac dilatation or pulmonary embolism, it is the result of advanced pathology which has complicated an otherwise simple operation In other words, it is due to delayed operation and to ultraconservatism of the internist Some of the most difficult surgery I am confronted with occurs in just these cases of interval appendectomy The appendix oftentimes is so firmly embedded in organized exudate and adhesions that its removal is like digging out a piece of masonry, and requires not a knife, but a hatchet, pick, and trowel I have so often seen acute intestinal obstruction due to an adherent terminal ileum that now, when I fear such a contingency, I guard against it by anastomosing the ileum to the transverse colon at a point 8 or 10 inches distal to its terminal end

I have seen a few cases where very early in the attack the patient has had chills and high fever I operate these patients at once The characteristic finding is a gangrenous appendix and once in a very long while a gangrenous meso appendix which is black and thrombotic In some of these cases I have dissected out the veins and found them thrombotic as far as one could reach The prognosis is especially grave because most of these patients continue septic, become jaundiced,

and die after developing pyelophlebitis with multiple abscess in the liver

To return to the indications for operation Leukocytosis to my mind is not so telling as the presence of exquisite tenderness over the sight of the appendix In a walled off abscess exquisite tenderness can always be relied upon as determining the presence of pus while the leukocytosis is not nearly so reliable Just as in acute perforating peptic ulcer board like rigidity is an unmistakable sign so in appendicitis exquisite tenderness is decisive

In acute appendicitis it is not only the appendix that must be thought of but the peritonitis that results While it is the stage and extent of the peritonitis which act as the deciding factors in the question of when to operate the position of the appendix also plays a role in the process of peritoneal inflammation As you all know its most common position is to the outer side of the cecum or to the outer side of the cecum and colon or behind both In these circumstances the peritonitis has a better chance of becoming circumscribed thus providing a better prognosis than when the appendix is directed downward into the false pelvis or reaches into the true pelvis or lies among coils of small intestine With the appendix in the pelvis which is the second most common location the peritonitis is likely to be circumscribed and is apt to be more serious The most serious results however are to be feared from appendical peritonitis when the appendix occupies either its third or its fourth possible locations That is when it lies either below the terminal ileum and points directly to the left or above the terminal ileum and points upward and to the left It is this type of peritonitis by the way which closely resembles acute diverticulitis

When the peritonitis is localized and the appendix can be located the intraperitoneal operation is indicated The technic consists of walling off the peritoneal cavity around the site of the pathology before attempting to take out the appendix If pus is encountered it should immediately be mopped up with small gauze sponges until the wound is dry before the peritoneum is

incised One or more gauze sponges are placed in the wound and the surrounding healthy peritoneal field is very carefully packed off with one or more warm moist gauze sponges In delivering the appendix every precaution must be taken to guard against contamination, this requires the free use of gauze sponges and constitutes the most delicate part of the operation Delivering coils of bowel in attempting to find the appendix is courting danger, and is sloppy work which makes for mortality The chief anatomic points to be borne in mind are the cecum, the ileocolic and ileocecal folds of peritoneum The recognition of these structures makes for safety

It is when the peritonitis is diffuse or is spreading that the wisdom of immediate operation becomes doubtful The safest plan in these cases is to wait for localization by the usual means —anatomic and physiologic rest This procedure provides few regrets and its omission may be disastrous

When an abscess forms to the outer side of the cecum I make an extraperitoneal approach through an incision just above the crest of the ileum, dividing the muscles and opening the abscess from the outer side and if possible which it practically always is I remove the appendix I then place a piece of rubber dam against the cecum and pack the cavity loosely with gauze, as a rule, the incision is left open except for a few retention sutures introduced to prevent visceral escape When the abscess is more toward the midline I use a right rectus incision or incise immediately to the outer side of the rectus and carefully isolate the rest of the abdominal cavity by moist gauze pads before opening the abscess When encountering pus, in the pelvis as well as in the abdomen, as is so often the case, the peritoneal cavity is walled off with gauze pads, the appendix is removed and a glass drainage tube is introduced to the floor of the pelvis, the pus is drained with a syringe to which a rubber tube is attached Drainage is provided for by rubber tube, rubber dam, gauze, or glass tube

Why glass tube in preference to a rubber tube? This is a pertinent question which I will pause a moment to discuss The glass tube is preferable to the rubber because it drains much

more and can be aspirated more easily and it also serves the purpose of keeping the nurse on the job it being her duty to clean the tube sufficiently often to keep the dressing from becoming too much soiled The nurse is instructed to revolve the tube to prevent tabs of omentum from becoming engaged in the holes in the lower end which would make its removal more troublesome The glass tube remains in place for from twelve to twenty four hours It is removed by carrying a rubber tube through it and revolving it around the latter

The objections offered to the glass tube are the danger of its breaking which by the way I have had occur only once in my experience in this clinic and the other the greater likelihood of intestinal obstruction from a coil of bowel becoming engaged around it exposing the bowel wall and causing infiltration into the bottom of the wall resulting in arrested peristalsis

One great advantage of the glass tube is that it serves to make a nervous patient more manageable as he is told that the glass drainage tube in the wound may break unless he remains perfectly quiet

As to the general question of drainage versus closure of the wound without drainage I am guided by the results of the laboratory report on smears of the pus If the report is negative I close the wound and if positive drainage is instituted This correlation of the operating room and the laboratory is a routine of this clinic which we regard of the utmost importance and satisfaction

PELVIC DISEASE

The patient a woman aged forty five years complains of attacks of pain in the back which began about one year ago The pain is vise-like in character and not affected by exertion Her menstrual history is normal except that at her last period there was profuse bleeding and she has always had a slight discharge between periods The discharge however is neither bloody nor foul She has had one child now twenty years old no abortions or miscarriages There has been no loss of weight and appetite and digestion are good

Examination of the abdomen was negative except for tenderness on deep pressure immediately above Poupart's ligaments Vaginal examination showed tenderness upon moving the uterus, which was normal in size and position, and very marked tenderness and some fulness in both vaginal vaults The provisional diagnosis was chronic salpingitis with adherent tubes The cause of the recent hemorrhage is not easily explained, but, in view of this condition and considering the patient's time of life, I will first make a careful curetment and carefully examine the scrapings if any are obtained I have not been able to obtain scrapings, and will, therefore, put the patient in the Trendelenburg position and proceed to open the abdomen I now pack off with warm, moist gauze pads Now you can clearly see that the tubes are considerably enlarged and are adherent to the posterior surfaces of the broad ligaments and the uterus The ovaries are not diseased I will, therefore, remove only the tubes The uterus appears normal to the touch, but if there were any doubt as to this I would open by an anterior incision and make an inspection Closure of the abdomen Right here I would like to say that the curet is a dangerous instrument and must be used with judgment I hesitate to curet in the presence of inflammatory appendages in the soft and boggy uterus, whether infected or not infected The infected uterus, more often than not, is caused by abortion or miscarriage In either abortion or miscarriage, that is, in the early stages before infection has occurred, I do not hesitate to curet, but where infection is present I prefer treating the patient by the usual anatomic and physiologic rest as is the practice in this hospital

The causes of uterine bleeding are abortion, miscarriage, accidental separation of the placenta, placenta prævia, fibroid tumors chronic pyosalpinx, chronic salpingitis, tubo ovarian disease, intraligamentary cyst, extra uterine pregnancy, myopathic uterus, polypoid endometritis, hemorrhagic endometritis (infective endometritis), carcinoma of the cervix, carcinoma of the fundus of the uterus lacerated cervix with erosion and abrasion of the lips

It will, therefore, be seen that in cases where there are no

palpable findings our diagnostic acumen may be taxed in arriving at a correct conclusion Hysterotomy for diagnostic purposes will be indicated in a small percentage of cases

In emptying the uterus in cases of miscarriage occurring after four or five months and before infection has taken place I prefer to do an abdominal hysterotomy I have made over two hundred hysterotomies in this clinic for all conditions—accidental separation of the placenta placenta previa etc—without a fatality which I believe warrants the stand I take Quite a number of these patients have come under our observation later at full term pregnancies and been delivered normally without any trouble

The next case is one of pelvic inflammation The patient a young married woman aged twenty complains of pain in the lower left abdomen The onset was sudden four weeks ago associated with nausea and followed by tenderness over the lower abdomen more marked on the left side and pain radiating down the left leg When brought to the hospital eighteen days ago she was acutely ill The abdomen was rigid and tender and a pelvic mass was palpable Four days later I made an opening back of the cervix but obtained only bloody serum but no pus The acute symptoms having subsided I shall now make an abdominal section and explore the pelvis Here we have a large left tubo ovarian abscess This we will now proceed to remove with care and with it remove the left tube and ovary Drainage is provided and oozing controlled by placing a large piece of rubber dam and some iodoform gauze in the pelvis between the mesosigmoid the uterus and the right tube and ovary packing the pelvis with iodoform gauze

The gauze and rubber dam were removed on the tenth day and a rubber tube inserted The patient at this writing is still in the hospital and is making a good recovery

The next case is also one of acute pelvic inflammation The woman married and thirty eight years of age was brought to the hospital with a history of a sudden attack of pain in the lower abdomen which began four days ago associated with

nausea and occasional vomiting The lower abdomen was distended, very tender, and rigid Vaginal examination revealed a very tender mass and a suggestion of fluid

Fig 542 —Uterine fibroid with both tubes and right ovary Anterior aspect tilted to right

I shall make an incision behind the cervix and as you see evacuate considerable pus A rubber tube is placed in the wound

The subsequent history of this case showed that the operation promptly relieved the acute symptoms and nine days later

the abdomen was opened, when bilateral salpingitis and a small amount of free pus were exposed. The left tube and the right tube and ovary were removed. A cigarette drain was placed in the pelvis. The appendix had been removed at a previous operation. This patient also is still in the hospital and is doing well.

During the clinic there were four operations for uterine fibroid. The cases were simple ones treated by subtotal hysterectomy done under spinal anesthesia, and included the removal of both tubes and ovaries and the appendix, when present. The patients all made uninterrupted recoveries and left the hospital within sixteen days.

Fig. 543.—Uterine fibroid with both tubes and ovaries. Posterosuperior aspect. Cervix not shown.

Myomectomy is a useful operation in carefully selected cases. It is open to certain objections, consecutive and secondary bleeding is not uncommon, infection is more likely than after hysterectomy, and since the fibroid uterus is very often a sterile uterus, there is no reason why it should be conserved. In the event of either hemorrhage or infection, the subsequent disability is greater than after hysterectomy. Myomectomy is especially indicated in single, isolated fibroids, and in pedunculated fibroids located so that they can be readily excised or shelled out. The interstitial tumor, as well as the fibroid located

within the broad ligaments, can often be removed as an isolated tumor Myomectomy should be especially considered as the operation of choice in young women. The general contraindications to this operation are extreme anemia, salpingitis, multiple tumors; also in the case of a large interstitial tumor in which hemorrhage is apt to occur and difficult to prevent

In the simple fibroid, where the cervix is normal and the patient has not reached the menopause, subtotal hysterectomy is the procedure of choice

The type of hysterectomy depends upon the age of the patient, the condition of the cervix and of the uterus, the size and site of the tumor, its topography and the complications present in the shape of diseased adnexa, entanglements with neighboring organs, etc When the patient is past middle life and there is disease of the cervix I make a total abdominal hysterectomy.

In doing a subtotal hysterectomy the first thing is to deliver the fibroid, pulling it upward and backward, thus making the broad ligaments taut and exposing the bladder Then make a transverse incision of the peritoneum where it reflects from the bladder on to the uterus, the peritoneal reflection with the bladder can then be pushed downward and forward beneath the pubis, and carried out of harm's way, and with the bladder the terminal portions of the ureters The left broad ligament, including the round ligament to the pelvic or uterine side of the ovary, depending on whether or not the ovary is to be removed, is then grasped with a Spencer-Wells forceps, the ligament cut, and the forceps with point downward pushed down into the pelvis The uterine vessels are thus exposed, clamped, and divided. The same thing is done on the right side, and the supravaginal cervix is then amputated through a V-shaped incision The cervical canal is next sterilized with the actual cautery, the uterine arteries tied and the stumps of the broad ligaments transfixed, tied, and sewn into the wedge-shaped cavity of the cervix The final step of the operation is bringing the reflected serosa over the cervical stump and sewing it to the serosa of the posterior surface of the supravaginal cervix.

When the fibroid grows laterally from the supravaginal cervix, or from the side of the body of the uterus low down and between the layers of the broad ligament the incision is made in the anterior layer of the ligament and the tumor enucleated from before backward and below upward thus reducing the chance of injury to the ureters

When the fibroid springs from the fundus of the uterus and is retroverted and incarcerated in the true pelvis I begin the operation by *dividing the peritoneal reflection from the bladder* and then cut across the supravaginal cervix In some cases delivery may be facilitated by bisecting the fibroid and removing one half at a time

Total abdominal hysterectomy is the operation of choice for fibroids developing during or after the menopause especially when the condition of the cervix is questionable

The type of complete hysterectomy I prefer is the following After separating the bladder to tie off the broad ligaments and the uterine arteries thus exposing the supravaginal cervix and freeing it down to the vagina the upper portion is also freed down far enough to allow a right angled clamp to be applied close to the free end of the vaginal cervix which is pushed well upward before putting on the clamp The vagina is then amputated above the clamp with the cautery knife thus rendering the vaginal stump sterile The vagina is then closed with continuous chromicized catgut suture before the clamp is removed and again reinforced after the clamp is taken off This makes a purely intraperitoneal operation no communication having been made with the vagina The operation is finished by sewing the stumps of the broad ligaments to the vaginal stump and sewing the reflected serosa to the posterior surface of the extreme upper end of the vagina *This operation I believe is as satisfactory* and as safe as supravaginal or subtotal hysterectomy if the necessary precaution is taken to control bleeding and avoid injury to the ureter One must be very sure of having controlled all bleeding of the parametric connective tissue which has been severed in separating the supravaginal cervix and the vagina The safety of this step in the operation is enhanced by making

traction on the vaginal stump, grasping it, and lifting it up with a pair of Allis' forceps, and at the same time having the stump of the broad ligament held taut; this brings the bleeding points into view, especially if the sterile Cameron lamp is used. In order to remove any doubt about the ureter, when tying

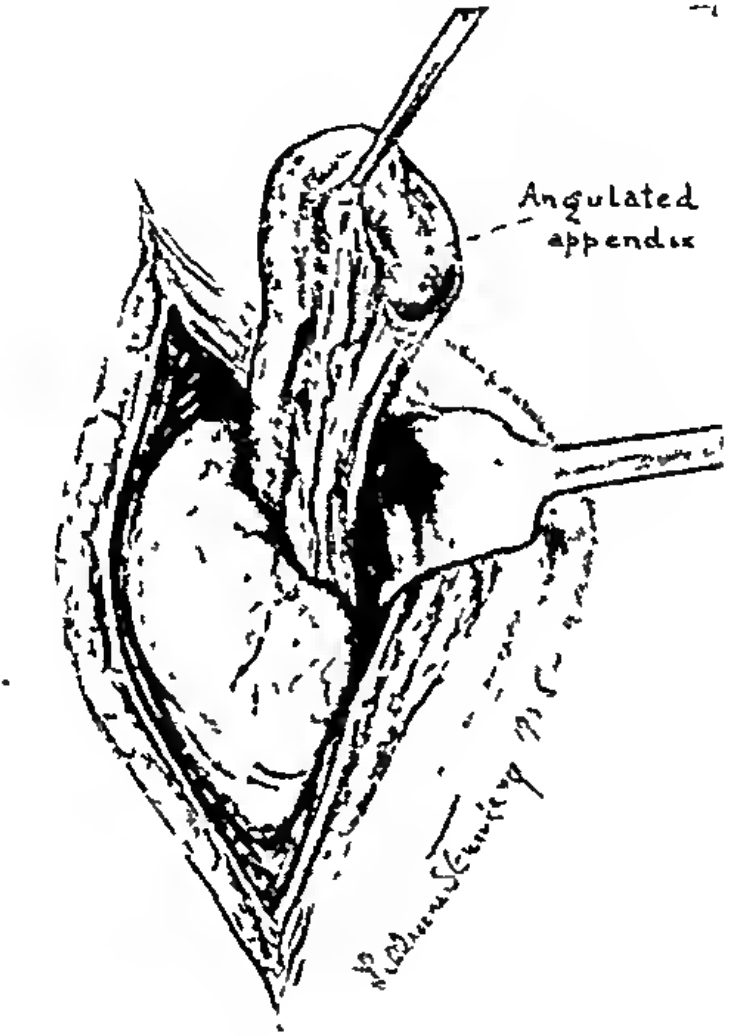

Fig 544 —Angulated appendix

the severed uterine artery just after it crosses the ureter, the ureter can be exposed in the fold of the broad ligament and traced to its entrance into the bladder This is very easily done. If all oozing has not been arrested before the reflected vesical serosa is sewn to the serosal covering of the posterior surface of

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may mean gangrenous appendicitis, peritonitis, pyelophlebitis, multiple abscess of the liver, etc, so that he never gets a chance to take that trip to the coast, but takes the journey from which no one returns This happens often enough to put the careful physician on his guard, because, as I have often said, no one can tell when a chronic appendicitis and which chronic appendix is going to develop an acute exacerbation

Chronic appendicitis, I say, is a clinical entity and a surgical fact and not a fancy It may be grouped into two types The first follows attacks of acute appendicitis and the other is chronic from the onset It is this form of the disease that is often treated for stomach trouble which has so many aliases, and comprises a fair proportion of patients who frequent the offices of the stomach specialists It causes a wide range of symptoms among which pylorospasm is a great sinner and misleads many a diagnostician And again, how often are patients treated and operated for chronic peptic ulcer, chronic cholecystitis, ureteral calculus, Dietel's crises, salpingitis, tubo ovarian disease, etc, when a chronically diseased appendix, lying either behind the cecum or lateral to the cecum and ascending colon, or both, or in the pelvis, was responsible for the entire train of symptoms This is an old story in this clinic

In the diagnosis physical examination, in which touch plays the most important rôle, is the essential to differentiation in most instances Diagnosis of chronic appendicitis by *x* ray may be of use but it makes no appeal to me

The safety of appendectomy needs no discussion The very occasional fatal case can usually be traced to some concomitant condition, and in very rare instances to some slip up in the postoperative treatment of the patient

Many surgeons object to the small McBurney incision which I so often use, because it does not give a chance for inspecting the other viscera I make the straight incision whenever I find it desirable to investigate the other viscera, and use the McBurney only in the clear cut case Oftentimes it is difficult to bring up the cecum and the incision has to be enlarged I need not go into further details as to the technic, except to say that

careful work is as essential as in the acute case although the chronic case rarely presents the same difficulties as the acute one

GALL BLADDER DISEASE

Six cases were operated for disease of the gall bladder and in 2 cases of ulcer a cholecystectomy was done in addition to the gastro enterostomy They have all made uninterrupted recoveries Some of the gall bladder cases gave the usual history of gall stone colic while in others the symptoms were those of so called dyspepsia Two of the removed gall bladders contained stones and one was of the strawberry type

In the diagnosis of cholecystitis we rely on the history and the physical examination It is sometimes difficult or impossible to differentiate this lesion from duodenal ulcer or appendicitis when the appendix lies high In these atypical cases also there is a great similarity of symptoms and sometimes the three lesions—cholecystitis duodenal ulcer and chronic appendicitis —are simultaneously present In such instances the important thing is to recognize the necessity for surgical intervention exact preoperative diagnosis being more of academic interest so far as the welfare of the patient is concerned *x* Ray examination oftentimes fails to reveal the pathology When the symptoms are sufficiently suspicious to warrant the use of the dye test for visualization of the gall bladder and the test proves positive operation is of course indicated In my experience an important point in diagnosis is the educated sense of touch I do not wish to belittle the laboratory because in our work we give the patient the benefit of a thorough study and examination Of course we have a urine analysis and blood count with coagulation time made and in all but emergency cases we do a Wassermann blood urea and blood sugar estimation as well as the phenolphthalein test *x* ray examination Graham dye test etc but in the final analysis we depend on the evidence obtained through the five senses and the sixth sense—common sense

The surgeon must be trained in the sense of touch and especially to differentiate between the feeling of normal tissue and

diseased tissue to the touch. You gentlemen know as well as I do that in cases of cholecystitis it is occasionally difficult to make a diagnosis even after you have opened the abdomen. How difficult it must he then to do so from the outside. The diseased gall-hladder is usually opaque, shows a deposit of fat, and the walls are frequently flabby, thickened, and lacking in tone. Oftentimes evidence of additional pathology is presented by the appearance of the liver, enlargement of the regional lymph-glands, pericholecystic adhesions, and induration of the pancreas.

Without going into the subject of diagnosis, I wish to say a few words with regard to jaundice in disease of the gall-hladder. It is usually due to extension of infectious inflammation by way of the lymphatics in communication with the liver, which results in cholangitis; or it may come from extension through the cystic and hepatic ducts. The most common cause of jaundice, as you all know, is ohstruction, usually calculous, of the common duct, obstruction at the head of the pancreas. Sometimes cholecystitis so much resemhles disease of the head of the pancreas that clinical differentiation is next to impossible. But, as I have said, the differentiation so far as the welfare of the patient is concerned is unimportant so long as the indications for operation are recognized.

In cholecystitis I should say surgery is indicated if, after a fair hut not too prolonged a trial, medical treatment fails to relieve the symptoms, or if after a period of relief the symptoms recur again and again. Duodenal tuhage by the Lyon-Meltzer method no douht has its uses, but it is our experience that the organisms found hy aspiration through the duodenal tuhe are rarely found at operation, that is, in the bile ohtained with the hypodermic syringe and subjected to careful examination. The indications for operation are as urgent in the non-calculous as in the calculous case, although in the latter the presence of stones is an added element of danger, the risk heing involvement of the adjacent and subjacent viscera—the liver, pancreas, duodenum, and even the stomach and spleen. It is not very unusual for splenitis which may call for splenectomy to develop as the result

of biliary cirrhosis Involvement of the pancreas is a familiar occurrence as I have frequently pointed out In short, the gall bladder has come to play almost as important a rôle as the appendix as a focus of infection In both the calculous and the non calculous type of cholecystitis the pathology usually is in the walls of the organ and not in the mucous lining This fact of itself is sufficient to account for the failure in most cases of medical treatment And as with appendicitis, so in cholecystitis removal of the source of infection gives the best chance of obtaining a cure

The technic of cholecystectomy to the abdominal surgeon presents few difficulties so that the radical operation is preferred except in certain special conditions when the conservative operation is the wise procedure, especially as a preliminary to secondary removal of the gall bladder

Cholecystostomy is indicated in acute cholecystitis where there is pus and where the condition of the patient forbids extensive surgery Also in disease of the pancreas demanding drainage it is better to drain through the gall bladder, other things being equal The drainage operation likewise is indicated in cases where the fundus of the gall bladder is diseased and the body not involved In such cases cholecystostomy provides a chance for the diseased tissue partially to recover and makes the secondary cholecystectomy a safer procedure

In doing cholecystectomy we place the patient in the dorsal position with a firm pillow under the back at the level of the liver This posture causes the liver and biliary passages to be pushed forward the costal margins to be widened, and the intestines to fall by gravity toward the pelvis An ample right rectus incision is made Exposure is secured by retraction and proper placing of gauze pads One pad is placed to carry the stomach and duodenum to the left one to carry the hepatic flexure of the colon out of the way, one in the subhepatic space, when the liver the gall bladder, and the right free border of the gastrohepatic *omentum are exposed* The incision is carried through the right free border, only through the peritoneal layer, and by careful manipulation I expose the upper part of the common and

lower part of the hepatic ducts, the cystic duct, and the cystic artery The cystic duct and the cystic artery are clamped

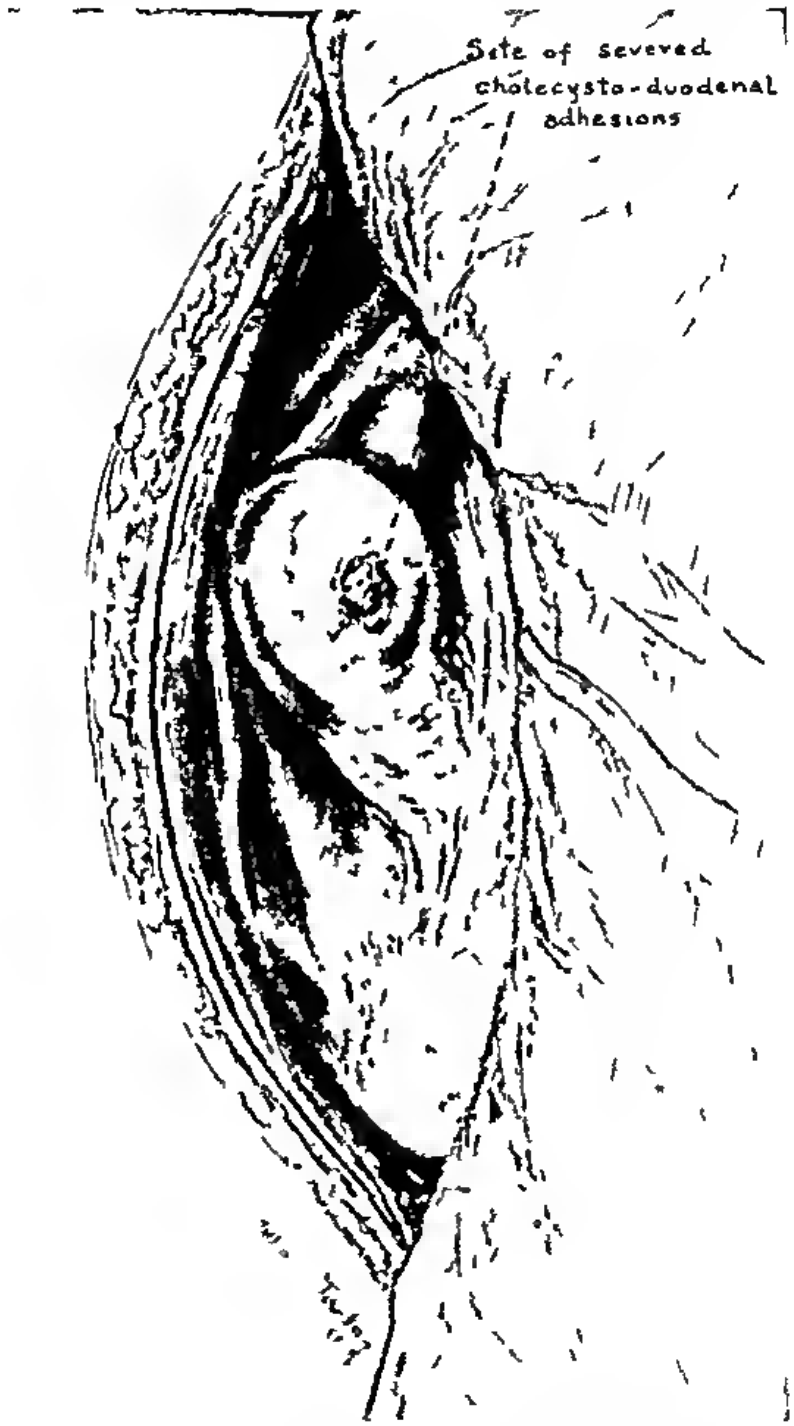


Fig 545 —Showing gall bladder after separation of adhesions to duodenum

separately, they are readily seen by introducing the Cameron light, and the presence of anomalous vessels and ducts is also easily recognized.

Sometimes the region of the cystic artery and duct is obscured by a mass of inflammatory exudate and it is not wise to dissect this tissue I cut it across distant to the hepatic and common ducts and as the cystic artery spurts it is readily identified but not difficult to grasp since retraction of the artery is prevented by its fixation in the inflammatory mass With a short curved needle the ligature is easily placed I always remove *the gall bladder from below upward because it gives better* command of the situation I now sew over the gall bladder fossa to obliterate dead spaces to control oozing and to promote healing There is still a little oozing so I place a glass tube in the subhepatic fossa

One of the disappointing and discouraging sequels of operation for advanced gall stone disease is death from the worn-out toxic myocardium This in our experience causes the majority of deaths especially in women Assuming the toxic heart is due to the gall stone disease infection is it not pertinent to raise the question whether early operation as against operation after ten or more years of a gall stone life would not have eliminated this risk

Rest morphin and nourishment with a certain amount of alcohol are the most promising medicines Too much medication we find harmful We rarely if ever have a death from peritonitis after operation Occasionally in the patient with long standing nephritis probably also due to the same toxic agent that has affected the heart muscle we occasionally have renal insufficiency Liver insufficiency is the fashionable topic for discussion today We rarely have a death from this condition except in a small percentage of the badly jaundiced cases This freedom from fatality is due to great extent to careful preoperative study and treatment

Other operations during the clinics were repair of inguinal hernia with appendectomy drainage of osteomyelitis of the mandible abdominal exploration removal of fibrolipoma of the thigh and cauterization of a urethral caruncle

CLINIC OF DR CHARLES H FRAZIER

NEUROSURGICAL SERVICE, UNIVERSITY HOSPITAL

THIS afternoon I propose to discuss three neurosurgical topics The surgical treatment of trigeminal neuralgia, the surgery of spinal cord tumors, and the surgical treatment of pituitary disorders

THE SURGICAL TREATMENT OF TRIGEMINAL NEURALGIA

Trigeminal neuralgia has become one of the large problems in this clinic if for no other reason than the increasing number of cases which apply for treatment Up to October 15 1925 we have had 1107 cases Before presenting the patients and discussing the operation which has been adopted in this clinic I should like to remind you that the ganglion must be regarded as composed of three units—the ophthalmic, the maxillary, and the mandibular—and for each of these units there is a corresponding representation in the sensory root

Case I —This patient, Mrs H B , age thirty six, was admitted to the Neurosurgical Service October 13, 1923 suffering from major trigeminal neuralgia, in the second and third divisions, of three years' duration The longest interval of freedom from pain was six months but for the past year there has not been a week when she has been entirely free of pain In the differential diagnosis the intervals of freedom from pain are a most important factor The pain is aggravated by talking eating contact, and this is characteristic of this particular disease, and we must remember in speaking of major trigeminal neuralgia we recognize a distinct clinical entity, quite different from any other neuralgia in this territory Extraction of the teeth,

of course gives no relief and yet a large majority have had most if not all the teeth extracted on the affected side

The operation was what we have termed a subtotal section of the sensory root by which is meant the section only of the outer two thirds of the root the inner or ophthalmic portion of the sensory root and of course the motor root is left intact As a result the patient is completely relieved there is no impairment of sensation in the ophthalmic division and the corneal reflex is intact

Now the question you naturally ask is this Will this patient develop a trophic keratitis after her discharge from the hospital? She was operated upon a week ago and as you see the cornea is clear and there is not the slightest suggestion of keratitis Leaving as we do the ophthalmic portion of the root intact we can give this patient assurance that she need never have the slightest concern about the cornea

Case II—To illustrate this point let us turn now to the next case E L D male age fifty two a physician who was operated upon January 3 1923 almost three years ago For four years he had had jumping burning lancinating flashes of pain in the second division He was relieved for a time by alcoholic injections but *never by morphin* *The operation in* his case was as in the preceding a subtotal resection of the sensory root with conservation of the motor root As a result he is relieved entirely of pain and has total anesthesia in the second and third divisions none in the first with preservation of the corneal reflex We will speak later of the differential diagnosis but let me refer just to one point illustrated in the case before us The patient states that he was *not relieved by morphin* It is an indisputable fact that morphin never relieves the paroxysms of major trigeminal neuralgia This is one of the curious paradoxes of this peculiar disease If you have the slightest suspicion that your patient is a drug addict you may rest assured no matter how closely the picture may simulate it you are not dealing with major trigeminal neuralgia

The question has been asked How do you close the incision?

It does not matter much how you close it, for, as you will see, this incision is entirely concealed within the hair line Someone asks if this patient has normal sensation in the forehead His answer is yes

QUESTION Do his eyes bother him?

PATIENT Not at all

DR FRAZIER In this final modification of the conventional operation, that is, the conservation of the ophthalmic portion of the foot, we believe the operation has reached a state of perfection well nigh ideal Prior to this one never knew when a keratitis might develop, now the incidence of this has been entirely eliminated The scar, as you see, is entirely concealed, there is no disfigurement and of course, there can be no recurrence In the past ten years following this operation, we have not had a single trophic disturbance develop after the patient left the hospital and, what is also interesting, in no case has there been any recurrence and in no case has pain developed later in the first division

It has been a matter of considerable surprise to us how many of our patients have been misinformed as to the operation, not only as to the risk of operation but as to the cosmetic results as well One would hardly believe that even today patients are told the operation will result in great disfigurement, the face will be paralyzed and they may lose the eye, all perhaps true a generation ago, but wholly without a semblance of truth today, so that many of our patients require a good deal of assurance before they consent to operation

The question of operative risk is, of course, a matter of vital concern as it always must be in operations of choice rather than necessity We have performed all told 370 major operations, with 2 deaths, in the last 278 operations there has been but 1 death a mortality rate of 0 5 per cent , and in the last 129 consecutive operations no fatalities so that the hazard of operation has been almost eliminated

Case III —The next case I bring before you because it illustrates one in which there is some doubt as to the diagnosis

It is of the utmost importance to be sure of your diagnosis before you operate This precaution may seem too obvious to justify mention but if you carry away from this clinic nothing else I would like you to remember this one point You must be sure you are not dealing with an atypical neuralgia If you perform the major operation on a patient who does not have true major trigeminal neuralgia not only will the patient not be relieved by the operation but apart from the pain which you have not relieved he will complain bitterly of the resulting numbness and the last state of that man will be worse than the first *This patient as you see is a young man in his thirties* and among other atypical features he has almost constant pain between his paroxysms This is quite at variance with our conception of major trigeminal neuralgia and yet in other respects his pain phenomena are very suggestive

In doubtful cases such as these I would advise you first to try an alcoholic injection for two reasons first because the injection will relieve the pain if it be true trigeminal neuralgia and second because if it is not the patient will be dreadfully annoyed by the resulting anesthesia From this test alone you may establish a diagnosis in doubtful cases I often say to the patient If you are operated upon you are going to be numb over a considerable portion of your face for the rest of your life If the case is not one of major trigeminal neuralgia the patient dreads the thought of numbness but if it is the answer will be I don t mind the numbness anything is preferable to this pain In either case the patient makes his own diagnosis

My suspicion has been aroused in the case of this young man for another reason He stays in bed the greater part of the day This is so uncommon a habit with patients suffering from the major form of neuralgia that I have come to regard it *as an important point in the differential diagnosis*

Case IV — In contrast to the preceding the next case is typical trigeminal neuralgia She is sixty five years of age and has had a number of alcoholic injections Interesting to note

though difficult to explain, is the sympathetic paralysis but, like most typical cases, she has what we call a "trigger zone" At first this trigger zone was in the third division, but lately it has jumped to the first division These trigger zones as in this case, are circumscribed areas about the size of a 10 cent piece, contact with which always incites a paroxysm

Case V —There is a good deal to be said about trigeminal neuralgia which, for want of time we cannot discuss this afternoon, but I bring before you the next case because of her age She is seventy two years old This brings up a question with which we are frequently confronted Is the patient's age a contraindication to operation? Trigeminal neuralgia is a disease peculiar to advancing years and if old age were a prohibitive factor many a patient would be denied the possibility of relief This patient's son came here from the west to inquire whether it would be possible or wise to operate on his mother because of her age As you well know, however age is relative and the condition of the individual case must be the determining factor It is our practice to keep these patients in the hospital under observation for a week or two During this time a careful investigation is made of the cardiovascular apparatus and renal function This lady s systolic blood pressure varies from 190 to 205, but a high blood pressure of itself is not a contraindication to operation Our statistics show that even in these old people we are able to perform the major operation with a mortality of less than $\frac{1}{2}$ of 1 per cent

Case VI —Now the next patient is of interest as illustrating the necessity of careful preparation in old people who might be said to be bad risks This old gentleman has suffered off and on for six years The last attack has been exceptionally severe, he has been unable to eat or sleep His nutrition has been disturbed, he is dehydrated, and physically exhausted He looks the picture of abject misery I will give this patient an alcoholic injection, this will afford temporary relief and enable him to receive the necessary amount of nourishment and sleep In

two weeks he will be quite transformed and a very much better surgical subject

You have seen enough of trigeminal neuralgia to get an insight into some of the important problems that have to do with the diagnosis and treatment We pass on now to the next topic

SURGERY OF SPINAL CORD TUMORS

Case I—The first case in this series Mrs J A age thirty five, was admitted to the Neurosurgical Service December 4, 1924 with a preoperative diagnosis of tumor of the spinal cord She had the following history Her first symptom, October, 1922 was pain under the right shoulder blade and down the right arm This pain persisted to the date of operation In October, 1923 she developed a paresthesia of the two outer toes of each foot and following this a gradually ascending anesthesia up to the level of the breasts In May 1924 the lower extremities began to lose power and the next month she complained of a girdle sensation Bear in mind this sequence of events—pain, paresthesia paralysis While not invariable I have found it constant in the majority of cases and regard it as of considerable importance in establishing a diagnosis

The examination revealed a marked tremor of each leg, the patient was unable to stand and temperature sensation was impaired up to the level of the clavicle and down the inner side of the arm the impairment was not as high on the left as on the right side All tendon reflexes were increased and she had a bilateral Babinski and ankle clonus She suffered from incontinence At the operation (performed December 12, 1924) an extramedullary tumor at the level of the seventh cervical segment was found and removed The pathologic diagnosis was endothelioma

Six months after the operation she had a slight paresthesia over the chest where the roots were sacrificed and her deep tendon reflexes were slightly hyperactive, but there was no Babinski and no clonus On October 9, 1925, ten months after the operation she is able to walk 6 miles

Case II —The next patient, T J S , age twenty nine, was admitted to this service February 17, 1921, with a preoperative diagnosis of tumor of the spinal cord From his history we learn that nine months before his admission he had a sudden, knife like pain in the region of the right scapula He had had subjective sensory disturbances in the legs for two months One hand was numb with some loss of voluntary control There was some weakness of the right leg An examination revealed rigidity of the neck muscles and fixation of the head There was atrophy of the scapular and shoulder muscles The biceps reflex was absent on the right, the movement of the right diaphragm was impaired, and there was partial loss of pain and temperature sense to the level of the sixth interspace

At the operation an extramedullary tumor at the level of the fourth cervical segment was found and removed About five years have elapsed since the operation, and, as you see, there are no signs of recurrence The patient has been able to resume his former occupation

Case III —S J G , age thirty nine, was admitted to this service September 5, 1925, with a preoperative diagnosis of spinal cord tumor In January, 1925 he had a cutting pain along the scapula, left side, in the region of the fifth rib This persisted to the date of examination (September 5th) In April, 1925 he experienced a numbness of both feet, followed by weakness in each limb He had had incontinence of bladder at times His Wassermann was slightly positive and he had received specific treatment, but no improvement was observed Our examination found a definite level of sensory disturbance, including tactile, temperature and pain, up to the level of the third thoracic segment He had a partial spinal block He had lost control of his sphincters and was unable either to stand or walk

September 23, 1925, about four weeks ago, I exposed the suspected region by a laminectomy, found and removed a tumor, which, as expected, proved to be an endothelioma Now, three weeks after the operation, he has recovered sufficient power in

his limbs to walk and except for vibratory sense he has complete return of sensation

Now what are the interesting and instructive lessons to be learned from these 3 cases? In the first place note that in all 3 the tumor was an endothelioma When we make a diagnosis of spinal cord tumor it may be either an intramedullary growth a glioma or an extramedullary growth but in 60 per cent of cases fortunately it is the latter a small elongated encapsulated tumor which lends itself readily to extirpation The intramedullary growth I regard as inoperable

What about the diagnosis? I regard the history of the case the sequence of events as of considerable importance and if you recall the histories of these cases you will remember that the first symptom was pain the second paresthesia and the third paralysis—pain paresthesia paralysis This is a characteristic though not invariable sequence readily explained when you recall that most of these tumors take their origin from the membranes near the point of emergence of the spinal roots Hence the first symptom is a root pain Then as the posterior columns of the cord become encroached upon the paresthesias develop and as the tumor expands the whole cord is compressed and paralysis follows

Curiously enough the vast majority of these tumors are found in the upper thoracic and cervical spine

I think a word should be said about the initial symptom—pain—because so often erroneous diagnoses are made If the pain is referred to the upper abdomen gall stones are suspected as happened in one of our series if the lower abdomen appendicitis or pelvic disease if to the region of the sciatic sciatica These are common errors And then I don t want you to leave with the impression that all spinal cord tumors must have root pains In one of our series not presented today an extradural tumor the patient had never experienced pain and for this reason she was allowed to go unrelieved with a diagnosis of myelitis until she was completely paralyzed Following the removal of the tumor she recovered completely

An important point in the diagnosis of spinal cord tumors is the presence or absence of a "spinal block." That was recorded in only one of the 3 patients you saw today. The lesson to be learned is obvious. The presence of a spinal block is strong presumptive evidence of tumor, its absence does not exclude tumor.

From the history and physical signs, as a rule, we may in most instances be reasonably confident as to the diagnosis. You noted in one instance the patient had a positive Wassermann reaction and the original diagnosis was myelitis. I have seen many cases stamped as myelitis even in the absence of a positive serologic reaction. The differential diagnosis is not, as a rule, difficult, and when there is sufficient data to determine the precise level of the lesion and the patient does not respond promptly to treatment, he is entitled to an exploratory laminectomy. Don't put off the operation until paralysis is complete in doubtful cases. Our first obligation to these cases is to make a presumptive diagnosis of tumor, our second, to establish the exact segmental level, and, as a rule, the latter is not difficult. It may be, as in one of these cases, the loss of a reflex arc, there may be muscle atrophy or other motor phenomena but, as a rule, the level of the lesion is determined by its upper margin of disturbed sensation. A very useful symptom for level diagnosis is the point to which the initial pain is referred. Examine critically the histories of spinal cord tumors, and you will be struck with the constancy with which the initial root pain persists from the very onset of the disease until your examination, it may *be one, two, or three years. Bear this in mind.*

Now you will be asked almost invariably two questions before operation. What are the chances of recovery of function? What is the likelihood of recurrence? As to the latter, recurrence is the exception rather than the rule. While essentially malignant, these tumors are well encapsulated, and if removed *in toto* they will not recur. As to recovery of function it is surprising not only how much function is restored, but how rapidly it is restored. In the case of this gentleman you see him walking three weeks after the operation, and this despite the fact that

the cord was compressed to one half its normal diameter Recovery of function depends, of course, upon whether the arrest of function is due to compression alone or to degeneration of the cord tracts If the latter, recovery of function is out of the question I think I am right in saying that in only one of our entire series did the paralysis persist As you view the cord on the operating table and see how it has been flattened out by the growing tumor, you wonder why any, not how much, power is restored In every one of the 3 cases exhibited today there has been practically complete restoration of function That is our expectation in all The element of time is an important one The longer the operation is deferred the greater the likelihood of permanent cord damage but on the whole the spinal cord tumor is one of the most satisfactory lesions with which the neurosurgeon has to deal

SURGICAL TREATMENT OF PITUITARY DISORDERS

This is the last field to be invaded by the neurosurgeon It was in 1912 that the first operation was performed in this clinic for a pituitary lesion At that time to be called upon to operate for this condition was an unusual experience, but since then over 177 pituitary cases have been entered upon our register, and at the present time there are in the hospital on the neurosurgical service 7 pituitary patients The profession is just beginning to realize the possibilities of relief, and patients are coming in at an increasing rate

For convenience of study we have classified our cases in four groups (1) pituitary dysfunction (2) suprasellar lesions, (3) pharyngeal pouch tumors, and (4) primary pituitary lesions, mostly adenomata

By pituitary dysfunction I mean cases with evidence of disturbed glandular but without definite signs of, enlargement of the pituitary body Seen usually at the age of puberty or adolescence it presents no indication for surgical interference and the treatment of the disease is more properly the function of the endocrinologist.

What do we mean by suprasellar lesions? These are lesions which develop in structures adjacent to the pituitary body, and because of their proximity to it and pressure upon it may present a picture comparable in every particular to a primary lesion of the pituitary body

Take, for example, this lady, Mrs C W L (Case I), who comes to our neurosurgical service with great accession of fat, with visual field disturbances and suffering from amenorrhea Here there is a clear picture apparently of a pituitary disorder If we had not the *x* ray as an aid to diagnosis we would make many mistakes In this case the *x* ray picture shows conclusively that there is no enlargement of the sella turcica Hence we must presume a tumor so situated that by virtue of pressure directly upon the pituitary body we find unquestionable evidence of disturbed function

The next case is a pharyngeal pouch tumor, and since this almost always occurs in children, the growth of the child is arrested In many instances these tumors become calcified and the diagnosis is often established by the *x* ray The calcified tumor or, as in this case, the calcified cyst wall is clearly seen in the roentgenogram

In 80 out of 100 cases of primary pituitary lesions the lesion is a simple, benign adenoma Thus there is an analogy between pathology of the thyroid gland and the pituitary body, and as in the thyroid gland so in the pituitary, cystic degeneration of the adenoma is not uncommon When the tumor develops in those of adult age, growth, of course, is not affected, and the patient exhibits either acromegaly an expression of hyperpituitarism (anterior lobe), or the Frohlich syndrome, a posterior lobe disorder In the growing child, however, we may have either dwarfism or gigantism, according to whether there is hyper or hypofunction of the gland This illustration gives you a very good idea of the appearance of the average adenoma You see it is well encapsulated and about the size of an Englisb walnut

The next case is an unusual one because the patient has definite evidence of cerebellar disorder in the ataxic movements

of the right arm and leg and yet besides this there are all the *earmarks of a pituitary disorder From* the x ray alone the diagnosis could be made You see how enormous the sella turcica is measuring 26 x 24 mm almost the largest we have ever seen We are confronted here with a difficult problem Are there two separate and independent lesions or has the pituitary tumor grown beyond the confines of the sella turcica and invaded the posterior fossa? I have seen instances in which pituitary tumors have grown beyond the sella to one side or the other into the temporal fossa but this is the first case in which there is reason to believe that the posterior fossa has been invaded

In the next case this young man we have another interesting and unusual phenomenon an oculomotor paralysis On exposing the tumor by the transfrontal approach we found an accessory or protuberant mass on the right side so situated that it could readily make direct pressure upon the oculomotor nerve A month has elapsed since the operation and as you see the paralysis has entirely disappeared These irregularities on the surface of the adenoma we have observed in other cases and they explain the asymmetric visual disturbances so often seen

One of the interesting phases in the study of pituitary disorders is the extraordinary variation in their clinical manifestations With precisely the same lesion one case may be a pronounced acromegalic without any headache or other pressure phenomena Another may present no stigma of pituitary disease and yet vision may be almost lost Another will not be acromegalic vision may be conserved but headaches may be intense We cannot explain these extraordinary variations We now have a case under observation with pressure headaches and beginning obscuration of the temporal fields but without the slightest evidence of pituitary dysfunction

For the recognition of a primary intrasellar or pituitary lesion we must place much reliance upon a proper interpretation of the radiographic plate As the tumor grows the sella turcica expands and in so doing must encroach upon the sphenoid

sinus Of course its vertical diameter will be increased and in long standing cases the dorsum sella and posterior clinoid processes will be atrophied but I place more importance on the encroachment upon the sphenoid sinus than I do upon the sella measurements

Five years ago Dr K, the next case, had his first symptom While hunting he noticed that in sighting his gun he could not see as well with one eye as with the other This dimness of vision in one eye continued for four and a half years without the slightest evidence of pituitary dysfunction Then he began to be handicapped because of the failing sight in the other eye How characteristic of the average pituitary history Almost invariably the vision of one eye is affected first In fact in almost 50 per cent of our cases the patient is totally blind in one eye and he continues more or less indifferent until he is threatened with impending blindness in both

Note also in this case the duration of the lesion, at least four and a half years These tumors are slow growing In some of our histories there is reason to believe the tumor had its origin ten, fifteen, or twenty years before we saw the patient

Now, before we show any other patients, permit me to outline briefly what I think should be your plan in the management of these primary intrasellar lesions There are three possible means of attack (1) organotherapy, (2) radiation and (3) surgical therapy

(*a*) *Glandular Feeding*—Organotherapy is the province of the endocrinologist, and in any audience I hesitate even to express an opinion If you are confronted by an enthusiast he will bowl you over with his array of good results As a matter of fact however, we have never seen a case that we thought had been affected in the least degree by glandular feeding save possibly one patient who did improve in some particulars on thyroid extract, but in the end it was necessary to operate for the conservation of vision

(*b*) *Radiation*—With radiation it is quite different Here there is no question that the treatment is effective, and the only

question is when should it be used Briefly when vision is not threatened and there is no risk in delay I could cite you a typical illustration in the case of a patient who was referred to this clinic because of beginning acromegaly and intense pituitary headaches Her vision was perfect and continued so I suggested to the patient a course of *x* ray treatment and the results have been eminently satisfactory Her headaches have been relieved There have been all told 7 pituitary lesions in this hospital that have responded to *x* ray treatment

Surgical Therapy—There is no excuse for making mistakes as to the progress of the case Is the patient better or worse? The visual fields give you the requisite information As with the toxic thyroid the basal metabolism is the index of the patient s condition so with the pituitary case an examination *of the visual fields will give you the information* you seek There is no excuse for continuing *x* rays or any other treatment if the visual fields show no signs of improvement

If radiation fails the only resort is to surgery and what may be accomplished by surgery? There is no doubt that we may relieve all pressure phenomena that is restore vision and relieve headache But we can do more than this we can relieve some of the glandular disturbances as well Somnolence may disappear fatiguability may give way to normal vigor the hands and feet may decrease in size excess fat may disappear Dysmenorrhea and amenorrhea are the most persistent of all the symptoms

The hour is nearly up now I must pass quickly over the surgical aspects Suffice it to say that there are two avenues of approach to the pituitary body—the transfrontal approach and the transsphenoidal approach and the surgeon must decide which of the two methods is to be preferred It is our belief that in every case where we have reason to believe there is a primary intrasella lesion the transsphenoidal operation is to be preferred chiefly because of its greater safety and as you can see from this patient the cosmetic results are perfect The scar is invisible and the mortality in this clinic is 3 per cent

In closing I will present these 2 patients because each repre-

sents what may be accomplished in restoring vision in the early and in the late case

Mrs L B age thirty one, was admitted to the neurosurgical service November 24, 1921, with a preoperative diagnosis of primary pituitary lesion Three years before she had had frontal headache nausea and vomiting She was rapidly gaining weight her menses bad ceased one year before operation, the *x* ray examination revealed atrophy of the posterior clinoid processes and a characteristic pituitary sella She had a complete bitemporal hemianopsia The operation was by the transsphenoidal route Now what has been the result? Her vision is perfect and her fields normal, and almost four years have elapsed without a suggestion of recurrence

Now contrast this result with that of the next patient He is totally blind in one eye and will remain so Why? Because at the time of the operation which was so long deferred, the optic nerve was totally atrophied In the other eye however, the field is perfect and with proper lenses he can read without difficulty The lesson to be learned is obvious The end results are in direct proportion to the duration of the lesion and the condition of the optic nerves Procrastination spells disaster

CLINIC OF DR FRANCIS C GRANT

UNIVERSITY HOSPITAL

THE TREATMENT OF CRANIAL TRAUMA

DURING the past ten years there has been a very definite trend toward conservatism in the treatment of intracranial trauma The high operative mortality that results from immediate surgical intervention in serious head injuries has produced a reaction in favor of a more careful consideration of the operative indications Hitherto concussion and continued stupor, with or without localizing signs pointing to the area of the brain injured seemed to most surgeons sufficient reason for immediate decompression As a rule no attempt was made to estimate the degree or nature of the injury or to formulate any rule upon which to decide for or against operation

The surgeon must realize his limitations in dealing with cranial trauma By surgical means we cannot restore the function of a damaged cerebral cortex A pulped and lacerated brain will recover what function it can spontaneously Our efforts should be directed toward improving the conditions under which this recovery may take place

The diagnosis of a fracture of the skull is often easy, at times difficult, never important A history of cranial trauma followed by an ecchymosis about the orbit definitely confined to the orbit and not shading off to the cheek subconjunctival hemorrhage, the escape of cerebrospinal fluid from the ears or nose, a subcutaneous ecchymosis over the trapezius below the mastoid process are all positive indications of a fractured skull Any discussion of the theories of the mechanism of fracture of the skull, whether bending bursting or expansile, may well be omitted, for the injury to the cranial bones is the least important feature in this type of case The prognosis depends in great measure

on the damage that has been inflicted on the underlying nervous structures A very extensive fracture of the vault that shows distinctly on the x ray plate may produce relatively few clinical symptoms while a short split in the base of the skull invisible on the skiagram is capable of causing alarming symptoms from involvement of the vital nerve centers about it It is the pres ence of these vital centers that makes the prognosis of basilar fracture so much more serious than vault fracture

Since we cannot restore the function of a damaged brain by surgical means what are the indications for surgical interference in cases of cranial trauma? We believe that there are two to prevent infection and to relieve an increase in the intracranial tension These are the only factors that are amenable to our control

It has been our practice to divide cases of cranial trauma into two classes First those patients that require immediate surgical attention second those that may be treated expect antly with delay or avoidance of any operative interference By immediate attention is meant within the first twelve hours after injury or as soon as the subject has rallied sufficiently from the shock of his injury to eliminate this factor as an operative hazard Never operate during shock If the patient does not rally from the shock of his head injury he will most certainly die if an operation is performed during this period

Two types of cases demand immediate surgical attention first all subjects with lacerations second those that show an increased intracranial pressure plus neurologic evidence of a lesion in an area of the brain accessible to surgery The opera tive indication in the first instance is to prevent infection in the second to relieve intracranial tension

Every scalp wound should be promptly and carefully ex amined to determine the presence or absence of a fracture be neath it and to débride and suture for the prevention of infec tion Cranial cases in civil practice are usually seen within six hours of the injury before infection has occurred The blood supply of the scalp is so free that following debridement suture is always indicated

Fig 546 —*Case I* J M male white age forty Fell Lacerated scalp wound to bone in right parietal region Stuporous disoriented *Physical examination* Left pupil larger than right Paresis of left extremities but not left face Diminished reflexes left Babinski left *x* Ray showed comminuted fracture of right frontotemporal region Lumbar puncture fluid bloody 22 mm Hg of pressure Subtemporal decompression right Dry brain Cortex herniated Ventricular tap found 15 c c bloody fluid Pressure relieved Drain beneath temporal lobe Patient roused sufficiently to speak after operation Wound drained cerebrospinal fluid freely Twenty four hours later patient again stuporous Died fifty six hours after injury hyperthermia

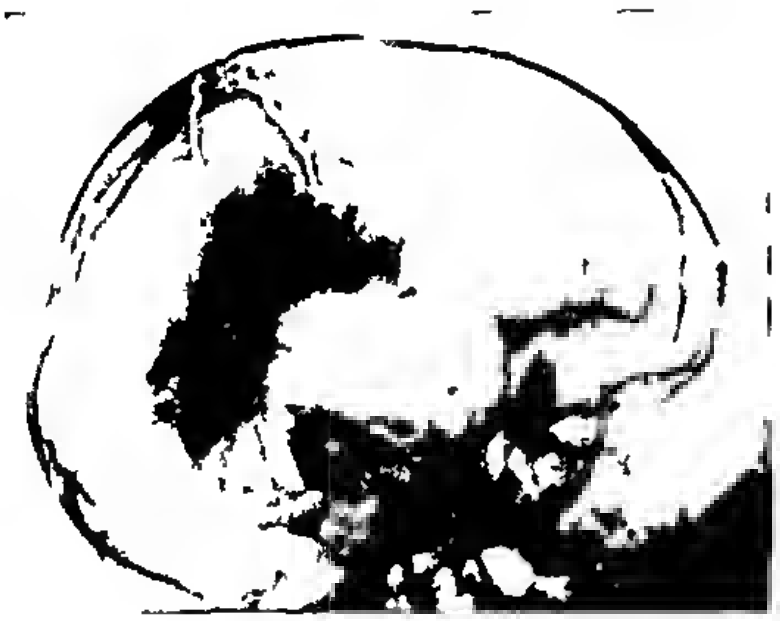
Fig 547 —*Case II* M D male white age fifty seven Struck over right temporoparietal region with blunt instrument Irregular laceration 4 inches in length Edges of fractured bone exposed at bottom of wound and macerated brain tissue exuding *Physical examination* Cranial nerves negative Speech thick Complete monoplegia of left arm Weakness left leg Babinski left Local anesthesia cleaning and débridement of wound Large bone fragments removed from brain, one having pierced ventricle Repair of dura by fascial graft Drainage of wound for twenty four hours No temperature reaction Complete recovery except for some weakness in left arm

All scalp wounds should be gently probed. If the bone has not been laid bare, the edges should be trimmed up and the wound flooded with an antiseptic solution such as dichloramin-T and the sutures at once inserted. If the wound extends down to the bone, it is enlarged slightly in its long axis, so that an underlying fracture, if present, may be seen. If no fracture is noted, the edges are excised, the wound swabbed out with an antiseptic, the galea and skin sutured in separate layers, and a rubber tissue drain inserted for twenty-four hours. In the presence of a fracture, the edges of which are in good position and free from foreign material, no more extensive treatment is required. When foreign material is noted in the fracture line, both edges should be carefully rongeured away until the bone is clean. The wound is then swabbed out, sutured in layers, and drained with rubber tissue for twenty-four hours. A depressed fracture must be raised. It is usually necessary to enlarge the skin wound sufficiently to allow a small trephine opening to be made. The depression is raised from within outward by a suitable instrument passed through the trephine opening. In compound comminuted fractures of the cranial vault remove as little bone as possible. All fragments, whether the periosteal attachment remains or not—provided dirt is not ground into them—should be left in place. It will be found that they heal in very kindly. It is a common mistake on the part of general surgeons to take away this loose bone with the thought that by so doing a more complete débridement is performed. Thus fragments are sacrificed unnecessarily and an unsightly cranial defect is produced. If cerebrospinal fluid escapes from the wound the overlying bone must be removed to a sufficient extent to permit suture of the dural tear, as a tight dural closure is the best safeguard against infection. If this membrane has been so damaged that closure is impossible, it is advisable to remove a section of fascia lata to repair the defect. Then replace as many of the bony fragments as possible, flood the wound with a mild antiseptic, close, and drain as described.

It is not within our province to discuss in detail the proper method of handling gunshot or other deeply penetrating wounds

of the brain They are not very common in civil practice A soft catheter should be passed along the track of the missile and all pulped brain tissue gently washed away Deeply situated bullets or bone fragments that cannot be thus removed had better be left alone Any attempt at removal will only result in further cerebral damage In peace times such penetrating wounds are in the great majority of cases made by bullets which are smooth and do not carry infection or foreign material deep into the brain as was the case with jagged shell fragments in war After washing out close the dura tight with a small piece of rubber tissue drain left between two stitches Debride and close the surface wounds The drain should be removed in forty eight hours

The second factor over which the surgeon has some measure of control is intracranial tension From this point of view head injuries may be divided into two classes Immediate operation is required in patients exhibiting symptoms of an increasing intracranial tension plus definite neurologic signs indicating with fair exactness the area of the brain involved The classical picture of hemorrhage from the middle meningeal artery is the best example evidence of rising intracranial pressure plus clinical findings pointing to a motor cortex involvement Whenever this syndrome presents itself surgical intervention should follow swiftly on the diagnosis A depressed fracture causing symptoms should be promptly elevated but intracranial tension alone without localizing signs we do not feel requires immediate operative intervention This condition may be handled as effectively by other means namely lumbar puncture and hypertonic solutions by rectum or vein Subtemporal decompression for relief of pressure is reserved as a last resort and is rarely performed in the first forty eight hours after injury Cranial trauma is an acute condition Treatment should be directed toward tiding the brain over the period of edema and swelling which follows the bruising from the injury The brain is contained in a rigid bony box The only opening of any size in the skull is at the foramen magnum at the base of the brain There is at the most only a potential space between the brain



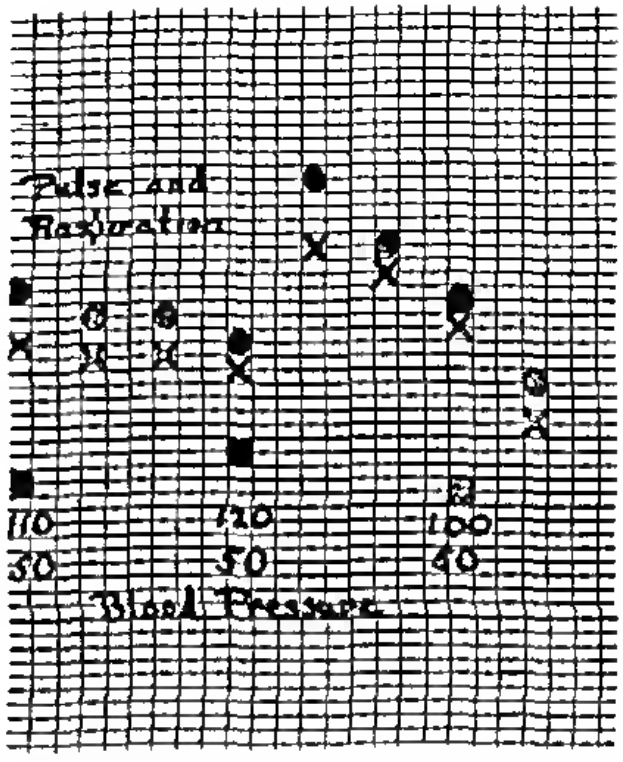


Fig 548.—*Case III* J M male white age five **Struck by automobile** Unconscious three to five minutes Admitted one hour after injury conscious but drowsy, crying ***Physical examination*** Reflexes lost in right arm Vomited brownish red material, probably blood *x* Ray showed bilateral fracture of both parietal bones especially on the right Lumbar puncture, fluid clear, 14 *mm* Hg of pressure Magnesium sulphate, 1 ounce in water, every four hours, for four doses Eighteen hours later patient entirely normal, conscious, and oriented

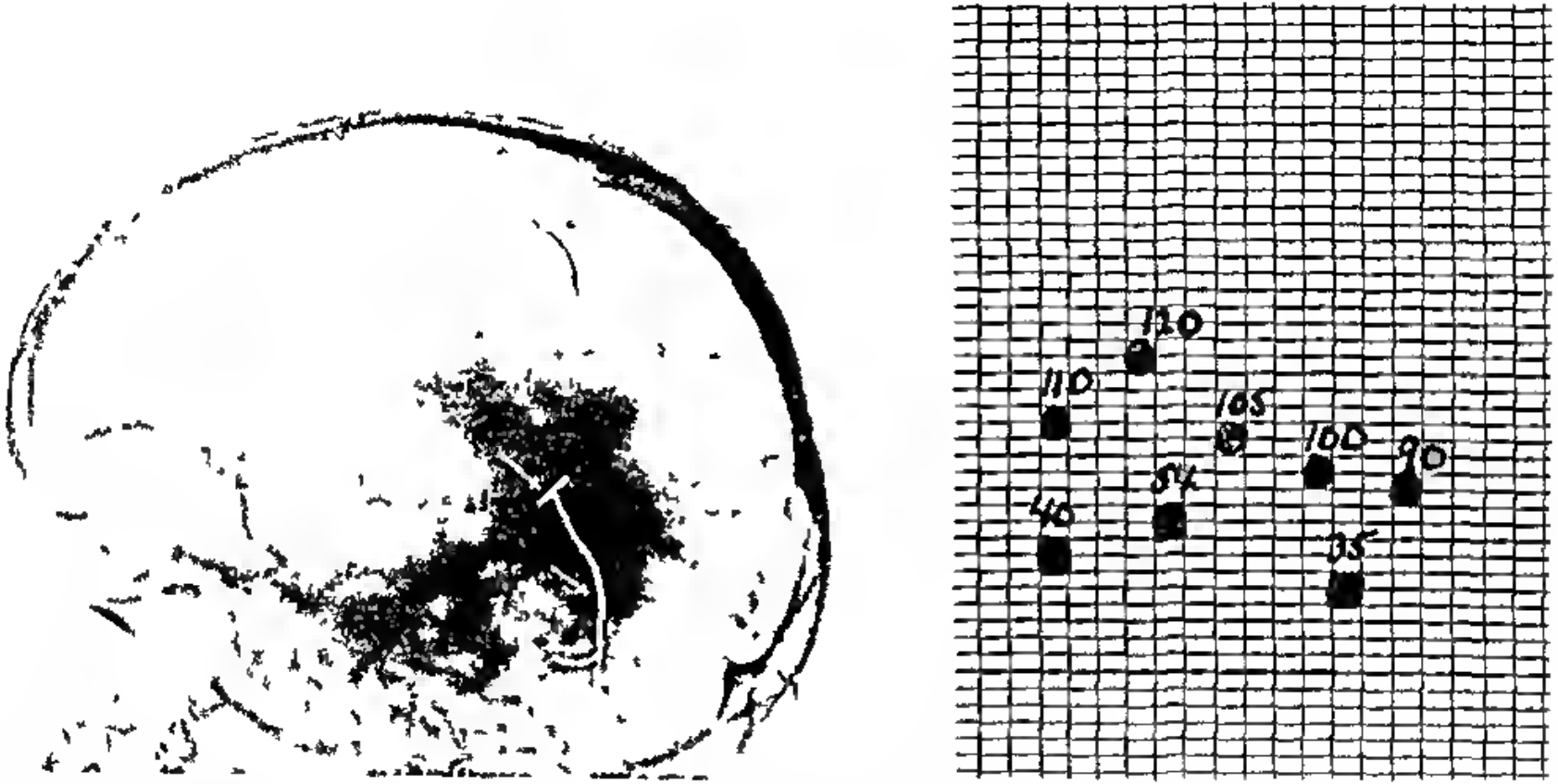


Fig 549 —*Case IV* H C female white age seven Struck by auto Unconscious Bleeding both ears *Physical examination* Right pupil larger than left Convergent squint O D Paresis right VI Weakness right VII, peripheral type Impairment reflexes right leg Bilateral Babinski x Ray showed fracture base of skull and right temporal bone Lumbar puncture, *fluid* bloody, pressure 18 mm Hg Removed 10 c c *Pressure 8 mm Hg Draining* watery fluid from both ears Ceased third day Recovered consciousness eight hours later Nystagmus to right Magnesium sulphate by bowel On discharge, two weeks later, right VI and VII nerves normal and nystagmus disappeared

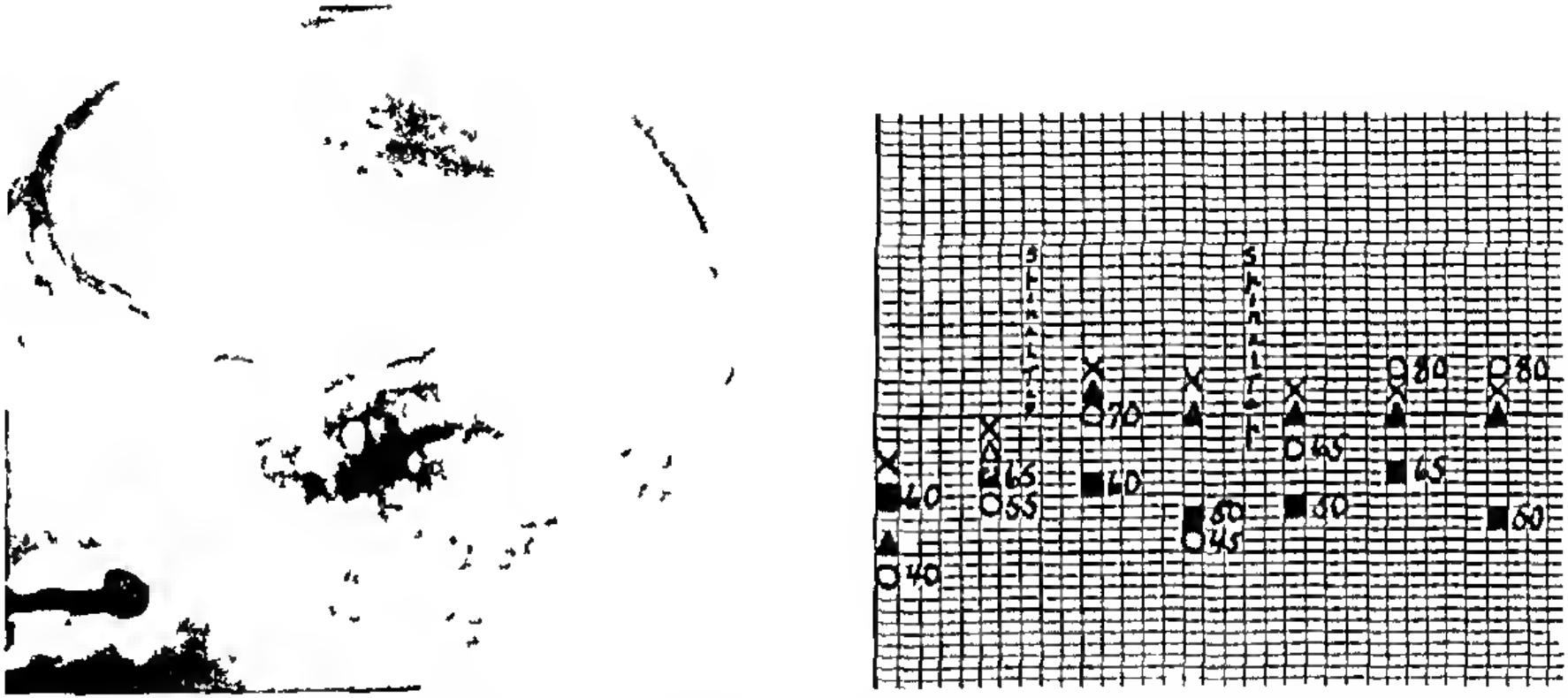


Fig 550—*Case V* J C male white age ten Struck by auto Pale shocked, unconscious pulseless Vomiting Lacera tion left frontal region *Physical examination* Pupils dilated right and left React slightly to light Weakness right VII Com plete areflexia Weakness *right extremities(?)* *x* Ray showed comminuted fracture right temporal bone to base Magnesium sul phate by rectum, fourth hour 1 fluidounce Lumbar puncture fluid bloody, 22 mm Hg of pressure, 18 c c removed Pressure 12 mm Hg Became conscious eight hours later Pulse fell to 45 Lumbar puncture fluid bloody 18 mm Hg of pressure, 15 c c removed Pressure 8 mm Hg Discharged two weeks later Right VII recovered

and its enveloping membranes and the surrounding bone Hence any factor such as an injury which causes the brain to swell increases the intracranial contents puts pressure equally on all parts of the brain and because of the inelasticity of the skull above forces the structures about the large foraminal opening at the base down into the opening and against its bony walls At the base of the brain lie the important vital centers controlling respiration and cardiac rate As these centers are caught between the pressure from above and the bone beneath their function is interfered with and the changes in respiratory and cardiac rate that accompany increasing intracranial tension are produced

Reduction in the amount of cerebrospinal fluid in the cranial cavity will lower the intracranial pressure Subtemporal decompression attempts to arrive at this result by allowing for the expansion of the intracranial contents through the bony opening and by the escape of the small amount of cerebrospinal fluid that occurs during the operation Speaking broadly in cases of cranial trauma two conditions are encountered on removing the bone and incising the dura In one class of cases on incising the dura a large amount of cerebrospinal fluid escapes The subarachnoid space may be distended with fluid and on nicking this membrane in different areas still more fluid is liberated It is in these cases with a wet brain that this operation produces the most definite relief of symptoms Other patients offer a striking contrast On incising the dura no fluid escapes the subarachnoid space appears empty the brain surface dusky and congested and the intracranial pressure forces the brain out against the edges of the dural incision so tightly that the cortex effectively plugs the opening through which drainage might occur So rapidly may this herniation of the brain take place that the operator may see the cerebral surface lacerated against the edges of the dural opening with the rupture of cortical veins and the production of annoying bleeding Operative interference benefits the patient but little where a dry brain is found

It is our opinion that the cases of wet brain may be dehy

drated and drained from within and the intracranial pressure thereby reduced by the use of lumbar puncture and by hyper tonic solutions at least as well as by subtemporal decompression In the dry brain cases—and they are unquestionably more serious and give a more unfavorable prognosis—surgical inter ference of any kind is of doubtful value The edema which followed the trauma and caused the increased pressure is appar ently tissue bound in the brain substance and is not seen as free fluid in the spaces about the brain That drainage through a trephine opening in the skull can result in the escape of much of this fluid seems unlikely but if the hypertonicity of the blood be raised through the use of salt solutions this tissue bound fluid will be drawn into the circulation removed from the brain and the intracranial pressure thereby reduced Hypertonic solu tions would seem therefore to be more effective in reducing the pressure in this type of case as well One cannot be too dog matic on this point There have been no cases of the dry brain group under our care in which operation was performed without relief of symptoms in which the subsequent exhibition of hyper tonic salt solutions by rectum or vein succeeded in saving the patient Nevertheless, the use of these methods of relieving pressure does not leave a defect in the skull and avoids the added strain attendant on a surgical procedure even though it be speedily performed under local anesthesia

Our routine treatment of cranial cases is as follows On admission the pulse respiration temperature and blood pressure are obtained If the blood pressure registers below 60 mm of mercury in systole or if the temperature is markedly subnormal a state of shock is considered to exist The head is lowered external heat applied, and one half ampule of pituitrin given by hypodermic If external lacerations are noted they are gently cleaned packed if bleeding flooded with dichloramin T and covered with sterile gauze A solution of 2 ounces of magnesium sulphate crystals dissolved in 6 ounces of water is allowed to flow into the rectum The head down position aids in the retention of this solution Nothing further is attempted until the temperature has regained the normal level and the

blood pressure has risen to above 60 mm in systole At this point a careful neurologic examination is made and *x* ray plates are taken Next any lacerations present are given proper care A lumbar puncture is performed with careful manometer readings of the pressure

We are now in a position to determine what the next step shall be We have the clinical picture the degree of intracranial tension and the appearance of the cerebrospinal fluid and may have information from the *x* ray to guide us If the neurologic

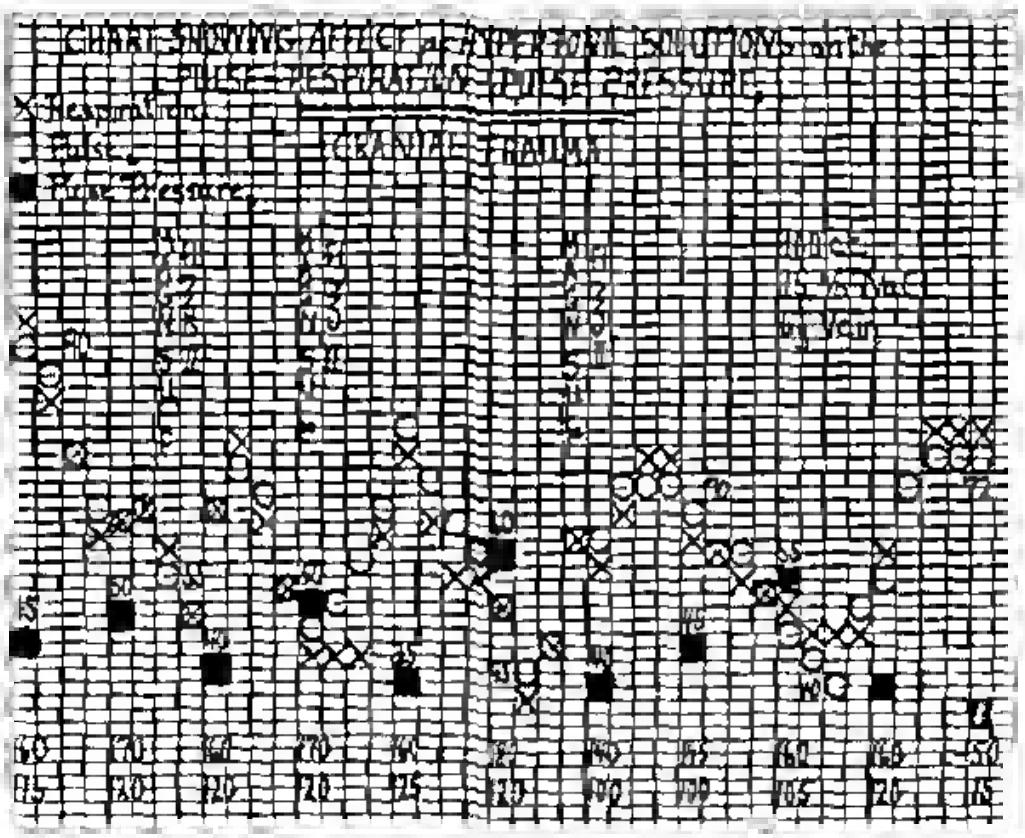


Fig 551 —Chart 1

signs point definitely to one hemisphere and to a certain area of that hemisphere we expose that region This applies only *to signs pointing to cortical involvement* We *do not decompress* for relief of injuries to the base of the brain That area is out of reach of surgery Paralysis or definite weakness of one or both extremities on the same side convulsions jacksonian in type motor or sensory aphasia are the kind of localizing symptoms that we require to feel that operation is indicated

If the neurologic signs are vague and indefinite, we do not decompress, no matter how high the intracranial tension may be All treatment is centered on the reduction of this pressure If the first lumbar puncture showed a high pressure, enough fluid is withdrawn to reduce it For example, if the pressure is not more than twice the normal of 10 mm of mercury, sufficient fluid is removed to lower it to normal If the increase is more than twice normal say to 25 or 30 mm fluid is drawn away until the tension is reduced one-half If the initial pressure was very

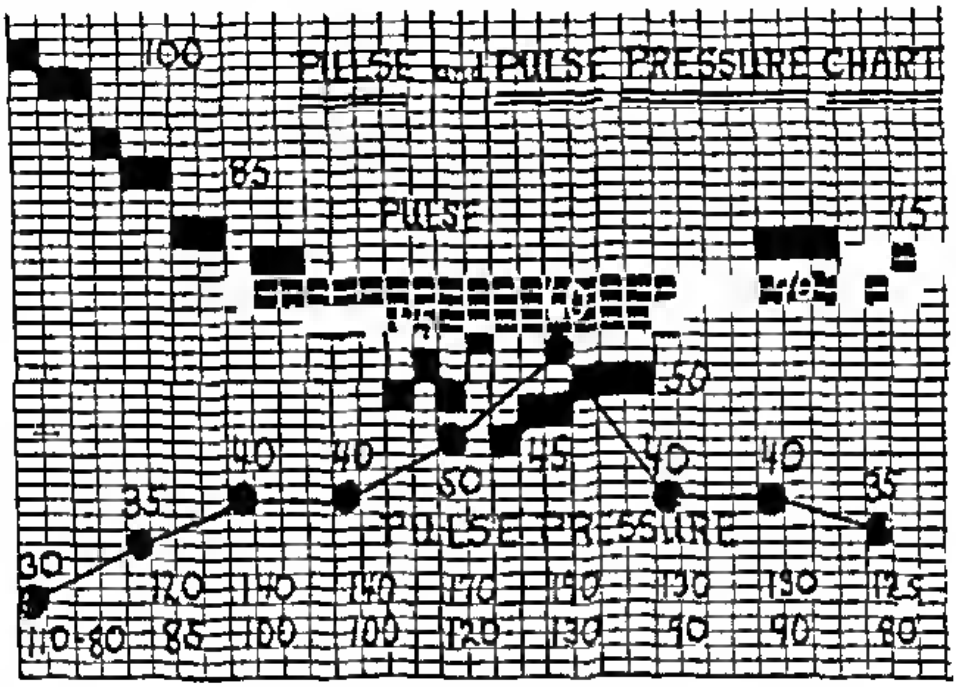


Fig 552 —Chart II

high or if the clinical signs do not improve the spinal tap is repeated in eight hours and fluid removed as in the first instance The patient receives a solution containing 2 ounces of magnesium sulphate crystals in 6 ounces of water every four hours by rectum for four doses then an ounce every hour for four doses

All cases of cranial trauma are given these rectal injections As a rule they are sufficient to prevent the manifestations of a rise in intracranial tension from appearing If, however, the pulse and respiration rate continue to be depressed or become retarded and the pulse pressure—as shown by the blood pressure readings—continues to rise until it equals the pulse rate then

other steps are necessary to reduce the rising tension within the cranium If the failing pulse and rising pulse pressure are not accompanied by increasing stupor or increase of neurologic signs 100 c c of a 15 per cent solution of sodium chlorid are given by vein at the rate of 2 c c per minute It is important *to give this solution slowly*

If stupor still advances and the neurologic picture continues to change for the worse then and then only is decompression indicated It should be performed whenever possible under local anesthesia We usually try to tap the lateral ventricle on one side before opening the dura This procedure is not difficult to one who is familiar with ventricular topography relieves the pressure on the base of the brain directly and permits opening the dura widely without danger of sudden cerebral herniation Once the intracranial pressure is relieved by this means it is an easy matter to lift the temporal lobe and insert a rubber tissue drain down to the base of the brain in this region We always accompany decompression with drainage leaving the drain in place until signs of pressure have disappeared We have never seen a meningitis develop following this procedure We believe that we have saved cases in this way that might otherwise have perished We do not feel that in acute trauma simple decom pression without drainage is sufficient

In general all cranial trauma patients should be kept quiet This may best be obtained by chloral and bromids if restlessness sets in Morphin is contraindicated as a sedative as it may depress the respiration and confuse the clinical picture Mechan ical restraint should be avoided whenever possible Straining against handcuffs or anklets increases the intracranial pressure as well as irritates the patient Even after the critical stage is past these cases should be kept in bed for at least two weeks or longer if possible They should be warned against returning to their normal pursuits for at least two months By this enforced rest many of the unfortunate sequelæ of head injuries dizziness headache and convulsions may be avoided

One or two clinical signs have we found of value in prog nosis Neurologic evidence of extensive damage to the base of

the brain, of course, renders the outlook less hopeful. Pupillary dilatation, particularly if the pupil is fixed, is of grave significance. The temperature reaction is of definite value. If the temperature increases rapidly and reaches 104° or 105° F., death almost always results. If it rises slowly for forty-eight hours and does not fall as it should at the end of that period, it is our experience that an exitus will probably occur, but if the fever subsides, even though the condition of the patient does not in other respects improve, we consider it a most encouraging sign.

A cerebrospinal fluid leak we feel to be of good import. It is evidence that spontaneous decompression has occurred and that the intracranial tension has been relieved. Rarely do we see meningitis set in as a result. In treatment nothing should be done to prevent the fluid from escaping. The ear or nose should be lightly packed with cotton soaked in a mild antiseptic to render it sterile externally, and this cotton should be changed hourly if saturated. Do not spray the orifice or pack the cotton in tightly. The flow of fluid should always be from within outward. These patients all receive hexamethylenamin (urotropin) in large doses, but its effect is probably empirical. Non-interference with the free drainage of the fluid and the sterilization of the external opening through which the leak occurs is much more important than the exhibition of antiseptics by mouth.

In the two years ending July 1, 1925, in the allied Hospitals of the Post-Graduate School of the University of Pennsylvania, 156 cases of cranial trauma were treated, of such severity that hospitalization for at least twenty-four hours seemed indicated In 103 of these cases a history of unconsciousness lasting for at least five minutes was obtained; 36 cases showed demonstrable fractures on the *x*-ray films; 5 of these cases showed no signs of concussion. In 21 cases the cerebrospinal fluid on lumbar puncture was bloody, but roentgenologically the skull was negative for fracture. Thirty-four cases were diagnosed basilar fracture, 11 by *x*-ray, 23 clinically or at necropsy. Thirty-six cases were proved vault fracture, 25 by *x*-ray, 11 by clinical or necropsy evidence. Eleven of the basilar fractures perished, 6

following operative interference Four patients with a fracture at the base were moribund on admission

Of the 36 cases of vault fracture, 8 died, 3 following decompression Six recovered subsequent to a surgical procedure Three of the 8 cases that perished had other severe injuries Our mortality in basilar fracture was 32 per cent , in vault fracture, 22 per cent , and our total mortality in all cases 27 per cent (See Table I)

TABLE I

70 CASES DIAGNOSED FRACTURE—19 DIED 51 LIVED—MORTALITY, 27 PER CENT

36 vault—8 died, 28 lived—mortality 22 per cent
34 basilar—11 died, 23 lived—mortality, 34 per cent
Vault Fractures
Operative mortality 25 per cent
3 moribund on admission
3 died following operation (2 decompression, 1 débridement)
9 lived following operation (5 decompression 4 débridement)
Basilar Fractures
Operative mortality, 55 per cent
4 moribund on admission
6 died following operation (all decompressions)
5 lived following operation (all decompressions)

This series is small Probably another year's experience will bring our mortality in basal fractures of the skull up to the 40 or 50 per cent reported by most observers, but we shall continue our treatment along the lines laid down, believing that we can accomplish at least as much by them as by immediate and indiscriminate operative interference

CLINIC OF DR GEORGE P MULLER

University Hospital

1 Preoperative Preparation of Surgical Patients — Dr Muller

2 Purpura Hæmorrhagica with Therapeutic Splenectomy — Dr Fitz Hugh Jr

3 Postencephalitic Tic of the Diaphragm — Dr Pepper

4 *Results of Peri-arterial Sympathectomy* — *Dr Muller*

5 Symposium on Lung Abscess
- (*a*) Medical Aspects — Dr Kern
- (*b*) Roentgenologic Aspect — Dr Pancoast
- (*c*) Bronchoscopic Aspect — Dr Tucker
- (*d*) Surgical Aspects — Dr Muller

6 The Treatment of Superficial Burns — Dr Ravdin

7 Blood Transfusion Methods — Drs Kolmer and Ravdin

8 Symposium on Chronic Gall-bladder Disease
- (*a*) Symptoms and Diagnosis — Dr Riesman
- (*b*) Laboratory Tests — Dr E G Ravdin
- (*c*) Surgical Aspects — Dr Muller

9 Surgical Operations
- (*a*) Harelip — Dr Muller
- (*b*) Chronic Gall bladder Disease — Dr Muller
- (*c*) Duodenal Ulcer — Dr Muller
- (*d*) Omental Adhesions — Dr Muller
- (*e*) Pyonephrosis and Nephrolithiasis — Drs Muller and Ravdin
- (*f*) Subacute Appendicitis — Dr Ravdin
- (*g*) Pilonidal Cyst — Dr Ravdin
- (*h*) Carbuncle — Dr Muller

PREOPERATIVE PREPARATION OF SURGICAL PATIENTS

DR GEORGE P MULLER

THE two clinics which I will give in this hospital today and on Thursday have been arranged with a view to remember the criticism of past clinics namely that too many cases were operated upon and not enough time given to demonstrations of unusual things of technic and of results Accordingly we are presenting only a few operations and I have enlisted the services of a number of my colleagues in the hospital to help make the mornings instructive and interesting for you

First a word about the proper preparation of surgical cases I do not mean the immediate preparation on the table nor even the preparation of the night before but rather that preparation which implies a study of the patient s condition and his resistance The problems of hemorrhage infection and shock from trauma and exposure must be met at the time of operation Modern surgery has largely eliminated these complications and the risk from them is very slight

Today the searchlight of criticism has been turned on the anesthetic the pulmonary complication and the elimination Local anesthesia has attained a wider field massive atelectasis has been studied well the cause of postoperative pneumonia is better understood Crile has taught us the great value of large doses of water in the postoperative treatment Not satisfied surgeons are trying to apply the lessons of biochemistry to the study of the individual who must undergo an operation in order to fit him better for the ordeal Some patients handicapped by physical defects must submit to an operation for a disease otherwise incurable We endeavor to evaluate the metabolic reaction *and the possibilities of resistance and so improve them in the* short time available as to make operation reasonably safe The most important groups are (1) the diabetic (2) the patient with depressed liver function especially in common duct ob

struction, (3) the patient with depressed heart and circulatory system, (4) the patient with toxic goiter

When you consider that the mortality of general operations on the diabetic can be reduced to that almost as low as on the non diabetic that the mortality of operation in cases of gastric retention and obstructive jaundice can be reduced 50 per cent, and that the surgical treatment of toxic goiter has been made quite safe we can realize the importance of what is called pre operative treatment of the handicapped patient with a surgical disease"

No doubt you will be struck by the constant reference to lab oratory tests The so called laboratory diagnosis of the disease has given place to the laboratory estimation of the degree of disturbed function and the ability of the patient to acquire a resistance Blood chemistry is now all important to the surgeon Basal metabolism for goiter vital capacity for thoracic disease, blood urea creatinin and non protein nitrogen for renal function, blood urea plasma CO_2 volume blood chlorids for the alkalosis of stomach retention and intestinal obstruction, blood sugar and plasma CO_2 volume for the diabetic and the jaundiced patient, tests for liver function in the jaundice case the electrocardiogram for the damaged heart

All of these and the older methods of blood pressure esti mation measurement of output and that indefinable thing called surgical judgment, are needed if we would carry treat ment to a successful termination in the handicapped patient

But, in addition to the accumulation of mere data the modern surgeon must be equipped mentally to carry into prac tice the information he has gathered and institute the treat ment required in the individual case before the major operation can be considered Most of us are familiar with the proper use of the standard drugs morphin has become the greatest boon to the patient since Crile has taught us the reasons for its free use Very few surgeons cling to strychnin as a stimulant for patients suffering from postoperative shock Digitalis appar ently has an enormous use at the present time and I am afraid that we are getting a little routine in our favoritism for this drug

Recently Geist and Goldberger (1923) studied 100 cases and noted a distinct lessening of pulmonary complications and a maintenance of postoperative blood pressure in place of the usual fall But Marvin Pastor and Carmichael (1925) of the Yale School state that there is no convincing evidence that the preoperative administration of digitalis exerts a favorable influence on blood pressure or the incidence of postoperative complications They do not find any apparent justification for its routine employment in patients who possess normal hearts

When we are treating a patient handicapped with a heart lesion helped by digitalis preoperative digitalization is of great value but it does seem that routine can be followed too far and as certain preparations of digitalis are expensive its routine use in patients with normal hearts seems unnecessarily wasteful even if no harm is done to the patient Hamilton writing from Lahey s Clinic does not advocate digitalis in the tachycardia of toxic goiter when the heart rhythm is normal

You have noted the constant reiteration in various papers to the use of water We must learn the value of proctoclysis hypodermoclysis and intravenoclysis in preoperative treatment Note the reference to glucose to supply heat and energy to the tissues and remember that you must know how and when to use insulin to speed up its oxidation The chlorids of the salt solution are needed to help elimination of excessive nitrogen waste products Remember that the old fashioned purge to encourage elimination works by helping to get rid of the non volatile acids eliminated through the bowel and kidney but do not purge your patient just preliminary to operation because of the loss of water thereby produced with resulting blood concentration

The management of diet is important Suppose you have done a temporary inter rib puncture drainage for a patient very ill from empyema He needs a high protein diet but the prostatic with weak kidneys needs a low protein diet Naturally the diabetic needs strict dietary regulation and the patient with a damaged liver and pancreas needs a diet low in fats

Some of our patients tell us that they have been taking a

tonic containing iron "to build them up" before operation Everyone should be familiar with the fact that most of the recent investigations, notably one by Williamson and Eto (1925), have shown that the administration of inorganic iron has no therapeutic value in anemia We practice blood transfusion for anemia, we do not do major operations on cancer patients who are at all anemic until they have been transfused We prefer to transfuse many of the chronic jaundiced patients We have very fortunate results with transfusion in certain septic cases On Thursday Dr Rawdin will discuss blood transfusion at length

I cannot help but think that attention to detail in the study of our seriously handicapped patients on the part of my associates on the service has helped materially to improve our results The surgical service of this hospital begins its year on September 1st, and from September, 1922 to September, 1923 I had a general operative mortality of 5 7 per cent During the year September, 1924 to September, 1925 our mortality was 3 1 per cent One more word, Dr Walters sent me the paper which he is to read on Thursday night and it contains a sentence which is well worth while repeating "When more than one procedure can be followed for the treatment of a surgical disease, the one chosen should be that which the individual surgeon can carry out with the least immediate or ultimate risk to the patient"

PURPURA HÆMORRHAGICA WITH THERAPEUTIC SPLENECTOMY

DR. THOMAS FITZ HUGH, JR.

Case Report—The patient whom you see before you is Mistress E T, eight years of age She was admitted to the University Hospital June 8, 1925 with petechial lesions over her body and bleeding gums and slight fever Her past medical history and family history contained nothing significant The illness which brought her to the hospital began three months prior to her admission Physical examination on admission

revealed nothing important except the purpuric lesions There were no glandular enlargements and the spleen was not palpable Hematologic studies indicated the classical syndrome of purpura hæmorrhagica namely a thrombocytopenia (varying from 6000 to 30 000 platelets) a prolonged bleeding time (from eight to thirty minutes) a non retractile clot and a positive tourniquet test There was a moderate secondary anemia (3 600 000 red corpuscles 52 per cent hemoglobin) and a normal or slightly elevated leukocyte count (12 000) with normal differential leukocytic blood picture Other laboratory tests including urinalyses a blood Wassermann blood calcium and blood clotting time—were all essentially normal

The patient was treated by various medical measures over a period of nine weeks without improvement This treatment included massive irradiation of the spleen (Roentgen ray) according to the technic elaborated by Dr Pancoast and his associates and also protein shock treatment in the form of sterilized milk injections No noteworthy change occurred either in the clinical condition of the patient or in the hematologic abnormalities Accordingly on August 13th nine weeks after admission and over five months after onset of illness splenectomy was performed by Dr Muller The operation itself was uneventful as was also convalescence The spleen was engorged with blood but not unduly enlarged It weighed 71½ grams when it reached the pathologist Microscopically there were found some proliferation of sinuses and moderate fibrosis The day after splenectomy the platelet count had risen to 74 000 Three days after splenectomy the platelets numbered 228 000 Five days after the platelets were 273 000 the bleeding time was one minute the tourniquet test was negative and all petechial lesions had disappeared while oozing from the gums had ceased entirely This happy state of affairs has persisted to date The patient as you see is robust and healthy looking She is now going to school and feels perfectly well You can see what tight garters she has been wearing under her knees and yet in spite of this unwitting tourniquet test there are no ecchymotic areas on her legs Today (October 27 1925) her

hemoglobin is 85 per cent, her red corpuscles 4,760,000, white leukocytes 8000, her platelets 250,000, her bleeding time two minutes and three-quarter minutes, and her clotting time ten minutes. The retractility of her blood clot however, has never returned to normal. This is the only bit of evidence remaining to prevent us from classifying her as a *protem* cure at least.

Discussion.—The natural history of purpura hemorrhagica should make us very wary of premature conclusions regarding the effects of treatment. The vagrant and unpredictable course of chronic purpura hæmorrhagica (whether it be the continuous or intermittent variety) renders the assessment of therapeutic efficiency very difficult indeed. Patients with this disease have been known to have spontaneous remissions lasting several years. Hence no patient can be safely classified as "cured" until the lapse of time and repeated hematologic examinations have proved a permanent status. Another element of uncertainty is inherent in these very hematologic examinations, especially the platelet count. This procedure is subject to tremendous error unless performed by experienced and scrupulously careful workers. We prefer to have each platelet count done by several independent workers.

The treatment of purpura hæmorrhagica has advanced in recent years along four main lines: (1) Blood transfusion, especially for the acute types, (2) protein shock measures, (3) splenic Roentgen ray treatments, first the so called "stimulating" splenic irradiation of Stephan, and recently the radiological "destructive" massive irradiation of the spleen suggested by Pancoast and his associates and (4) splenectomy. Of these by far the most striking is splenectomy.

Splenectomy is contraindicated in the acute fulminating types of purpura hæmorrhagica. Most of the fatalities after operation in this disease have occurred in these acute cases. In the chronic forms of the disease however, the results have been gratifying in most cases and brilliant in some. Just as the spleen exerts a destructive influence on the red cells in hemolytic icteric-anemia, so in purpura hæmorrhagica the spleen appears to destroy the blood platelets as first pointed out by

However since the spleen is only part of the reticulo-endothelial system it is probable that splenectomy removes only part of the pathogenic factor in this disease Hence it is not surprising that there is in many cases of purpura hæmorrhagica after the usual striking post splenectomy rise of the platelet count a gradual return of the blood to its previous state of thrombo cytopenia In spite of this however all but very few patients with chronic purpura hæmorrhagica have been greatly benefitted by splenectomy and there are now about 10 five year cures on record in the literature

POSTENCEPHALITIC TIC OF THE DIAPHRAGM

DR O H PERRY PEPPER

The interest in this patient centers around the proper analysis of the very peculiar breathing which this patient exhibited when he came into the hospital last winter In November this man had been taken sick with an acute illness during which he was delirious and had pain in the head back of the neck and extremities weakness of the left hand and some weakness of the left side of the face It was probably an attack of epidemic encephalitis lethargica Following this he was left with a tremor of the hands and weakness of the hands which very slightly improved throughout December and January, and then in January of this year he first noticed a very unpleasant abnormally rapid respiration He seemed to be breathing very fast and very hard and had to be propped up against pillows and was unable to carry out his work as a miner This condition persisted and he was referred to Dr Frazier Upon examination it was found that he had impairment of his seventh and eighth cranial nerves horizontal nystagmus negative Wassermann very marked tachypnea With each movement of the chest there was at times a partial closing of the left fist A very careful laryngeal and vestibular examination was made Both were negative Dr Frazier decided that there was no cerebral neoplasm and sent him to the medical service for further study He was found to have a respiratory rate of

from 60 to 90 to the minute and he seemed to be breathing very rapidly His respiratory rate was at times more rapid than his pulse rate However, he was not a bit cyanotic or dyspneic, he could lie perfectly flat and climb slowly upstairs For more careful analysis we made a number of pneumographic drawings and a fluoroscopic study, and it was seen that the diaphragm was twitching at a rapid rate The chest was simply jolted by the diaphragm We could get him to take a deep breath entirely independent of this twitch of the diaphragm, but most of the time there was no true respiratory movement The twitch would go on while he was breathing voluntarily at the rate of 20 a minute We could see the whole breadth of the diaphragm move during such deep inspiration, but as it moved it was also twitching constantly Our diagnosis was a tic of the diaphragm, probably a residual thing left over from his encephalitis Why did this make him stop respiratory movement? We looked for laboratory assistance for confirmation of our suspicion, and found, as we expected that he had a very low blood content of CO_2 He had blown off so much CO_2 as a result of the tic that the P_H was shifted to the alkaline side He had so little CO_2 in his blood that his respiratory center was not receiving any stimulus to bring about respiratory movements The urine, as anticipated, was alkaline The diagnosis then was made of postencephalitic tic with overventilation If we could stop the tic the stimulus to breathing we believed, would return Some times the patient's hand closed with the tic This made us think it was the phrenic nerve We therefore asked for a sur gical consultation, and suggested that the phrenic nerve be blocked to get temporary relief from the tic As soon as the block was carried out the tic stopped and the respiratory rate returned to normal Since then the patient's breathing has been entirely normal and he has worked ever since (A full description of the features of this case and further remarks will be found in the Jour Amer Med Assoc November 7, 1925, 85, p 1485)

REMARKS BY DR MULLER The exposure of the

nerve is not a difficult procedure As in this case we prefer a small transverse incision posterior to the sternomastoid muscle and about 2 inches above the clavicle The external jugular vein must be avoided or ligated After the platysma and deep fascia have been divided the muscle is drawn toward the median line and the sheath of the great vessels located This is important because otherwise one might mistake the vagus for the phrenic nerve The scalenus anticus muscle is then located and on its anterior surface running obliquely from above down and in is the main trunk of the phrenic nerve In this patient the nerve was picked up on a hook and for a distance of about ½ inch was frozen hard by means of a spray of ethyl chlorid The wound was closed without drainage This procedure was done on both sides The thought immediately enters one's mind that such a procedure would cause a paralysis of the diaphragm but we know that there is an accessory phrenic and communications from other nerves in the upper thorax hence sufficient innervation reaches the diaphragm

Phrenicotomy as you no doubt know has been advocated as a means of assisting compression of the lung in pulmonary tuberculosis Division of the nerve would not be sufficient and hence it has been proposed by Felix to draw out the nerve from the chest in a manner similar to that done in the well known Thiersch operation for trigeminal neuralgia of the peripheral second division Some one has asked me whether we could not accomplish the same purpose by the injection of alcohol I believe that we could but we chose the freezing method because it seemed the least traumatizing and yet would destroy the axis cylinder

RESULTS OF PERI ARTERIAL SYMPATHECTOMY

DR GEORGE P MULLER

Ever since 1918 I have been interested in this subject having first come across one of the papers by Leriche at that time He began his work several years before but it was first brought prominently before the profession of this country in

1923 when be read his paper before the American Surgical Society and reported the results in 64 patients operated on I had hoped to bring before you for operation today a patient suffering from Raynaud's disease, upon whom I intended doing a brachial sympathectomy Unfortunately, the operation had to be postponed, but it seems worth while to tell you of my own experience, especially since I have had the opportunity to do the operation about seventy times My slides show only those operations performed to last May

RAYNAUD'S DISEASE

3 patients—6 operations

All patients cured in the sense that no further gangrene has appeared

BUERGER'S DISEASE

11 patients—12 operations

Eighty five per cent were improved as to pain Improvement mostly temporary, with a few permanent No relief of cyanosis Two patients had amputation later

GANGRENE

Diabetic	4 patients
	4 operations
Relief from pain	2 cases
Later amputation	3 cases
Senile	5 patients
	5 operations
Relief from pain	1 case
Later amputation	5 cases

MISCELLANEOUS

Type	Cases	Result
Painful stump	3	50 per cent
Painful scar	1	No relief
Trophic ulcer toe	1	75 per cent
Scleroderma	1 (2)	50 per cent
Trophic contractures	3 (5)	2, pain free
Arterial thrombosis	1	Death, cerebral
Causalgia	1	Not relieved
Leg ulcer	2	Cure
Trophic ulcer foot	2	Cure
Trophic gangrene finger	1	Cure
Trophic pain	1	Cure
Eczema hand	1	Apparent cure
Total 48 operations on 41 patients	One death	
Mortality 2 1 per cent		

My experience has taught me that in established senile gangrene with pain the operation is useless and does not stay the progress of the gangrene It is useless in diabetic gangrene It may be as has been reported by others, that certain cases of peripheral arteriosclerosis with pain and acrocyanosis may be relieved but I have not had such good fortune Furthermore, the arteries in the femoral region in such patients are sclerosed, and not only is it practically impossible to strip the adventitia, but the vessel is often adherent to the sheath and nasty bleeding from muscular branches may be a source of great annoyance In one patient I tore a small branch and during the attempt at lateral ligation the artery was pulled in half and had to be ligated Fortunately, the profunda and the collaterals were able to meet the emergency and gangrene did not occur This man had arteriosclerosis Buerger's disease and angina pectoris The sympathectomy was done in the hope of relieving pain in the feet, I also did a resection of part of the cervical sympathetics, but obtained only temporary relief

Generally speaking, I am not pleased with the results in Buerger's disease Sometimes the pain is relieved but usually they lapse I might remark that I have tried all of the well known treatments for Buerger's disease, and have found that sooner or later amputation is inevitable in nearly every case

We have been more fortunate with those patients who suffer from an assortment of peripheral disturbances of the extremities which might be included under the blanket term "trophic" The cases of Raynaud's disease have proved remarkably successful, many vague trophic edemas, joint swellings, joint stiffness, etc with pain have been relieved Trophic ulcer is another favorable indication and one of the most remarkable cases that I had occurred in a young man who injured his foot in a mowing machine He probably cut the posterior tibial nerve and several years later began to show trophic disturbances manifested by pain sweating and coldness, and blueness of the extremity he then developed a trophic ulcer on the heel which persisted for two years in spite of all efforts at treatment In November, 1923 I did a femoral sympathectomy and practised

ordinary surgical measures on the ulcer, pain disappeared, and one month later the granulations were flush with the surface A single "pinch graft" was applied and healing was rapid I have heard from him within a week and he has remained perfectly well We had another patient on Dr Mdler's service who had various medical complications of a serious nature and who suffered from a polyarthritis with stiffness and pain in the ankles and feet He was bed ridden hut allowed us to try a sympathectomy as an experiment on one leg His pain disappeared and he was so comfortable that he begged five months later that we perform the operation on the other side

Such cases and there have been several others make us feel that the operation is well worth while in selected cases I will not dilate upon the theory except to say that Leriche believes that when the sympathetic net is interrupted for a distance of 7 or 8 cm the vasoconstrictor action is interfered with and the peripheral arterials dilate This is shown hy increased warmth and hetter color to the skin Certain anatomic workers especially Todd and Kramer, have raised the question as to why a mere stripping of 7 cm of adventitia containing the sympathetic will give results when the vessel receives twigs from the somatic efferents Sometimes clinical experience outstrips apparently exact knowledge and it may he that the sympathetic arrangement on the hlood vessels needs further study

The technic of the operation is perfectly simple The surgeon must know the anatomy of Scarpa's triangle and of the region of the brachial artery in the upper arm We generally use local anesthesia but sometimes must reinforce it with nitrous oxid or ethylene The artery is exposed for a distance of at least 4 inches and carefully separated from the adjacent vein and nerves This is particularly important in the case of the brachial where the median and ulnar nerves must he considered Having isolated the artery from the sheath tapes are put under it and used to make traction Fine toothed forceps pick up the adventitia and with the point of a knife a start is made, then, partly with the knife partly with small scissors and partly by peeling the adventitia is thoroughly removed from the ar

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thing like this A bronchopneumonia at the end of ten to fourteen days begins to clear up in most of the lung, but there is persistence of the lesion in one area During the same time the temperature becomes more widely fluctuating, the patient has profuse sweats and looks more and more toxic The sputum tends to become more purulent and often has a peculiarly fetid odor Abscess after tonsillectomy is frequently ushered in by localized pain attended by cough and fever, and is commonly mistaken for a pleurisy or pneumonia

Physical signs vary widely, depending upon the location of the lesion An abscess situated close to the chest wall will give early and obvious signs usually those of a localized consolidation and later perhaps the evidences of cavity formation Here again the findings will depend upon whether the cavity is empty or full at the time of examination, such a variability of signs before and after the expectoration of a quantity of purulent sputum is in itself highly suggestive

On the other hand if the abscess is deeply seated, the physical signs are difficult to elicit there may be only slight localized impairment to deep percussion, perhaps a few distant rales on coughing and a slightly diminished expansion on the affected side In these cases the clinical picture may come to our aid

Roentgen ray is, of course, invaluable not only in the diagnosis, but in the exact localization of the lesion

I will mention only to condemn the dangerous procedure of attempting to diagnose lung abscess by aspiration, since the withdrawal of an infected needle through a clean pleura may add the serious complication of empyema Picot has reported 6 such instances, with fatal results in 3

The second responsibility which the internist faces is What treatment shall he recommend operative or non operative? Statistics have shown in the past that a certain number of lung abscesses heal spontaneously or as the result of postural drainage and the like, while others go on to progressive lung destruction and a state of prolonged hopeless invalidism, with death as a welcome issue for the patients out of their wretchedness

Experience is beginning to show that we can often judge

which course a particular case is likely to take The chief differentiating characteristics are these (1) An abscess in an upper lobe is more likely to clear up without operation than one in a lower lobe because there is natural drainage (2) An abscess close to the surface of the lung that is close to the pleura has but a meager outlet for postural drainage through the bronchial tree Such an abscess is hard or impossible to reach with the bronchoscope and it is in this type that we must usually resort to surgical intervention On the other hand an abscess situated deeper close to the hilum of the lung is in an excellent position for spontaneous drainage and direct bronchoscopic treatment

Let me present 2 illustrative cases This man twenty two years old following a bronchopneumonia had a persistent cough pain in the chest purulent sputum and fever The physical examination showed very vague signs in the lower right lobe far from the surface and the roentgenogram confirmed the suspicion of an abscess close to the root of the lung This seemed an ideal case for medical and bronchoscopic treatment After a single bronchoscopy his cough stopped his temperature became normal and he is now symptom free and gaining weight

This man fifty six years of age was admitted to the hospital after two weeks of illness He had a bronchopneumonia with patches of consolidation in both lower lobes Instead of improving at the end of two weeks he developed a septic temperature a marked leukocytosis and began coughing up a foul purulent sputum The lung signs cleared up on the left side but in the right axilla there now remains an area of consolidation over the center of which there is at times a tympanitic note on percussion In this case the lesion was very superficial and eventual surgical intervention seemed indicated Last week the surgeon was asked to see the patient even though he had begun to improve clinically because the internist is so often accused of keeping these patients too long before seeking intervention The surgeon however agreed that further delay was justifiable An intensely septic patient in the early stages of a lung abscess is a very poor risk and might promptly die from the operation Most of these patients will improve somewhat for a

few weeks, under postural drainage, adequate feeding, and supportive measures, and will then be in much better condition for intervention. The further improvement in our patient in the last few days is a good example of this.

The question arises: How long should the internist wait for further improvement before advising operation? We believe the answer to be, Not too long! If the patient is doing well and both physical signs and Roentgen ray show an improvement in the lesion, one can certainly wait for six to eight weeks. But if an abscess has not cleared up at the end of three months, there is little likelihood that it will do so thereafter without the aid of surgery.

ROENTGENOLOGIC ASPECT OF LUNG ABSCESS

Dr. Henry K. Pancoast

The next step in the diagnosis and treatment of lung abscess following the clinical study of the case is the roentgenologic examination. A clinical knowledge of the case after a careful study has been made and history has been taken will aid materially in the correct interpretation of the Roentgen ray findings.

The first appearance that is likely to be found is that of an apparent lung consolidation which may or may not be characteristic. It must usually be differentiated from a delayed pneumonic process or a localized empyema, especially an interlobar collection. The clinical aspect of the case may materially assist in this differentiation. If not, we must wait for serial examinations made daily, if necessary, to show the second characteristic roentgenologic feature—a cavity. When that appears, especially if there is a fluid level with air above, the diagnosis is usually assured. A tuberculous cavity can usually be eliminated by careful correlation of clinical data and *x*-ray appearances. An interlobar empyema which has been tapped or ruptured into a bronchus and contains some air may cause much confusion, but the treatment is likely to be the same whether such a condition exists or an abscess is present. Dr. Kern has shown a case of this kind. Sometimes we are not able to find our

cavity until a bronchoscopic examination has been made and the cavity partly drained

If drainage is not imperative, the case may be examined at short intervals to observe progress or determine steps toward resolution If drainage is immediately necessary however, the next step is localization of the abscess for the benefit of the surgeon or the bronchoscopist Stereoscopic films may serve this purpose but it is usually advisable to make a lateral view and occasionally in addition an anteroposterior view with the patient lying on the normal side of the chest The bedside examination with the patient lying on the back and permitting only a single view is never very satisfactory for diagnosis and does not permit of localization Determination of the location by means of special apparatus used in foreign body localization has been proposed but such a procedure is hardly practicable except in small abscesses and even then it is a slow and tedious process

Sometimes a lung abscess is found when it is not expected clinically and is discovered in the routine *x* ray examination We have shown one case of this kind in which the abscess cleared up spontaneously

In another case we were very much confused by the coexistence of an old tuberculous fibrotic area and an acute abscess The latter condition was not interpreted until bronchoscopic drainage had made the abscess apparent in the films

In our experience tonsillectomy has been the most frequent cause of lung abscess Next in frequency have been postpneumonic abscesses then those due to foreign body Others have followed rupture of the esophagus from carcinomatous invasion and one case followed an operation on the jaw

BRONCHOSCOPIC ASPECT OF LUNG ABSCESS

Dr Gabriel Tucker

Bronchoscopy in suppurative disease of the lung as a diagnostic procedure gives accurate localization as to the particular portion of lung and lobe involved, and by the broncho-

scopic introduction of bismuth subcarbonate and lipiodol adds the accurate localization of pneumonography The existence of neoplasm can be determined by the bronchoscopic removal of tissue for histologic examination in many cases The first bronchoscopy is essentially a diagnostic bronchoscopy and if in consultation with the surgeon internist and roentgenologist it is decided that the case is not suitable for surgical treatment or that surgical treatment is to be deferred bronchoscopic drainage can then be carried out

Bronchoscopic treatment aids in restoring the normal drainage by aspiration of stagnant secretion removal of granulations dilatation of strictures and the local application of medication that will aid in restoring the bronchial mucosa to normal so that ciliary reaction can be re established The removal of uncontaminated secretion bronchoscopically from the involved area for the preparation of an autogenous vaccine has been of aid in many cases Bronchoscopic treatments are carried out once or twice a week as the condition of the patient may indicate General anesthesia is never used for bronchoscopy local anesthesia only is used in adults children require no anesthetic Under bronchoscopic treatment many patients improve none are made worse In some patients the progress of the disease has not been arrested but more definite localization of the lesion has occurred making the abscess more easily accessible to external drainage

The question of foreign body as the etiologic factor in pulmonary suppuration can usually be determined by bronchoscopic study and in cases where the foreign body is found and removed bronchoscopically 98 per cent of the patients will be cured without further treatment

In one patient a pedunculated tumor blocked a bronchus causing an abscess The removal of the pedunculated tumor bronchoscopically allowed free drainage and the pathologic process in the area of lung distal to the bronchial tumor cleared up resulting in permanent cure

Another patient developed a pulmonary abscess in the left upper lobe and a second abscess in the left lower lobe In con

sultation it was decided that external drainage be postponed and that bronchoscopic drainage should be used to supplement the medical care of the patient the surgeon to observe the patient regularly in consultation Bronchoscopic treatment was carried out over a period of six weeks and the abscess in the lower lobe cleared up completely The patient's general condition improved, but the abscess in the left upper lobe did not improve, and the surgeon performed external drainage on the upper lobe abscess resulting in cure the patient making complete recovery

The results of bronchoscopic treatment can well be illustrated by the following report of a case A man thirty years of age following an operation on the mouth under ether anesthesia developed a pulmonary abscess involving the right lower and middle lobes The pulmonary symptoms came on within the first week following the operation five weeks before his admission to the clinic When admitted he was running an irregular fever, up to 103° F at night and he had the appearance of being severely ill He was expectorating about 200 c c of foul, blood stained brownish sputum in twenty four hours Roentgen ray examination by Dr Pancoast showed evidence of abscess in the right middle and lower lobes (Fig 553) Physical examination by Dr T Grier Miller localized a pathologic process in the same area Bronchoscopic examination showed considerable pus in the trachea coming from the right main bronchus The mucosa of the right stem bronchus middle lobe bronchus, and the lower lobe bronchus was very inflammatory and swollen, the lumen of the bronchi being narrowed to about one half the normal diameter Pus was aspirated and was found to be coming from the middle and lower lobe bronchi Local medication with 2 per cent aqueous solution of mercurochrome by means of swabs was carried out

Dr George P Muller saw the man in consultation and advised that bronchoscopic treatments be tried before surgical drainage be resorted to

Following bronchoscopy the patient s temperature came down to a lower level A second bronchoscopy was done after

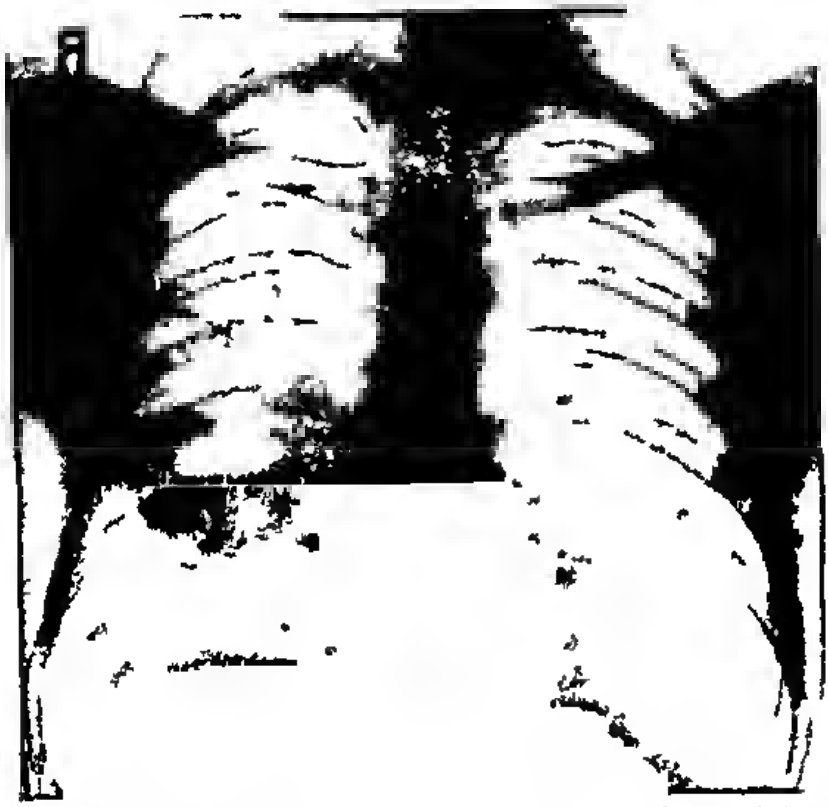

Fig 553 —Postoperative pulmonary abscess of the middle and lower lobes of the right lung Man aged thirty years Following seven bronchoscopic treatments abscess cleared up (Compare Fig 554) (Roentgenogram by Dr Henry K Pancoast)

Fig 554 —The dense area in the right lung has cleared The patient was well symptomatically and had gained 40 pounds in weight at the end of six months (Roentgenogram by Dr Henry K Pancoast)

an interval of three days and the local condition of the bronchi was found improved Aspiration was carried out followed by mercurochrome medication Improvement continued The offensive odor of the pus noted on the first bronchoscopy was less marked The quantity of pus expectorated in twenty four hours was diminished and no evidence of blood was found in the sputum Bronchoscopic treatments were carried out over a period of three weeks when the patient s temperature came to normal level and the pus was very much diminished Treatments were continued with progressive improvement and by the end of six weeks the man was symptomatically well Bronchoscopic examination at this time showed the bronchi of the right lung to be practically normal in appearance There was no pus in the lung The man had gained 25 pounds in weight and was discharged from the hospital and kept under observation as an out patient We show him here today six months after his first bronchoscopy He has gained in all 40 pounds in weight and has resumed his usual occupation Roentgen ray examination by Dr Pancoast shows no evidence of pathologic process in the right lung (Fig 554)

We feel that it would be a mistake to undertake independently the bronchoscopic treatment of lung suppuration The best interests of the patient are served by the co operation of the internist the roentgenologist the bronchoscopist and the surgeon

SURGICAL ASPECTS OF LUNG ABSCESS

Dr George P Muller

After the diagnosis of lung abscess has been made and the position of the abscess determined the next step is to secure drainage It seems to me that it does not make much difference how you secure this drainage If Dr Tucker can drain the abscess cavity bronchoscopically that is entirely satisfactory Bronchoscopic treatment always looks formidable to me but to the men who are skilled in the procedure it seems quite simple Therefore if you can cure a lung abscess by bronchoscopic

measures, one should naturally be cautious in recommending surgery. The surgical mortality in these cases has been high; some surgeons may boast of a low mortality, but if you strike an average, which you have to do, it will show that most of us have a mortality which is high enough to deter us from considering operation for lung abscess as a casual procedure. When medical treatment has failed, and when Dr. Tucker, because of the location of the abscess, has refused to bronchoscopically treat the patient, then we have to resort to surgery.

The next thing is to get your location, because, unfortunately, it is not like the soft tissues, where you can push your finger around and find the abscess. Dr. Kern said something against the use of the needle to locate the abscess. If pus is located and the needle withdrawn, some of the pus may be squeezed between the two layers of the pleura and you are liable to get a secondary empyema; it is this complication which should deter every man from the use of the needle for aspiration. The physical signs and the *x*-ray picture are much to be preferred.

After the abscess is located, we next have to determine whether there are adhesions between the lung and the parietal pleura, for the same reason that we don't want to use the needle; *i. e.*, if we incise the pleura and then push into the lung, we may have a large cavity caused by the pneumothorax resulting from shrinkage of the lung. This cavity will be infected and give us a secondary empyema. We find that where we expose the lung and suture it to the parietal wall or even line it with gauze and then go into the abscess to get immediate drainage, the patients do not do very well. In such cases I practice a secondary puncture below for an empyema which I expect. Simple thoracotomy at the bottom of the cavity is performed.

The great majority of these cases are not too sick for you to take time to stage your operation. If you find when you look into the "window" made by resecting the ribs that you see a normal looking lung surface with an abscess deep in the lung, you should endeavor to get the lung in contact with the chest wall. This is done by a variety of methods. We detach the parietal pleura from the intercostal membrane, using the great-

est care so as not to buttonhole then compress with iodoform gauze and when you remove the gauze in a few days the two layers of the pleura are in perfect contact and you can enlarge the window opening by another resection if you so desire

Another method is that used by Lockwood who makes an intercostal incision below and locates the abscess at a convenient point a rib is resected and the lung sutured partly out of the wound This is a difficult procedure and the mortality is high I prefer to have the roentgenologist locate the abscess perfectly and then go to the place he says and proceed in the manner I have outlined In entering the cavity we use the Kelly hemostat remembering that large vessels often line the wall or string across the cavity and may be ruptured by rough handling We then evacuate the abscess with the aspirator until the cavity is sucked dry the external opening is then enlarged and a plug made of several Mikulicz drains inserted with a rubber tube in the middle After a number of days we take out the Mikulicz plug nothing is then left but the tube

If all has gone well and the patient is symptom free and the drainage is free we advise the patient to leave the drainage tube in place after the method which Meyer has proposed and we have been most successful with the cases where the drainage-tube has been left in place a long time say six months Of course the natural tendency is to take it out earlier but you must remember that you have more or less bronchiectasis associated with almost all abscesses and the dilated bronchioles are filled with suppurating swollen mucous membrane If you take out your drainage too soon the collection will re form or start a bronchiectasis

In order to allow the fibrous tissues to compress these dilated bronchi therefore we leave the tube in month after month sometimes as long as six months The family doctor can be taught to handle the drainage Sometimes the tube slips out and must be replaced We do not perform lobectomy for lung abscess and we don t want to do it for bronchiectasis Graham s cautery operation is better than lobectomy in the average case

Perhaps 75 per cent of our lung abscess cases have followed

tonsil operations A number of reasons have been advanced for this one is that there is an inspiration of blood and bits of tonsil tissue following the use of a motor driven anesthesia apparatus, Dr Fetterolf of this city believes that the digging of the tonsil out of its bed in the throat exposes the muscles and that there is infection of the throat and sloughing with a thrombophlebitis which allows the infection to be carried to the lung and there give rise to embolic abscess

Dr Willy Meyer of New York is in the audience, and I am going to ask him to make a few remarks about lung abscess and also about carcinoma of the esophagus I myself have been greatly interested in this disease and have done 3 operations by the method published by Dr Torek Unfortunately all of these patients died and I hesitate to subject any more to the terrible risk

REMARKS BY DR. WILLY MEYER

New York

I had no idea that Dr Muller would call on me to say a few words I am completely unprepared I came here to see what was being done and to learn

I was certainly delighted to hear that in Dr Muller's Clinic they are following what we have been trying to preach in our cases of abscess of the lung for years, that is first to think of the patient s welfare and then eventually of operation

I was amazed to hear that in this age of prophylaxis 75 per cent of the cases of lung abscess in his clinic were noted "sub sequent to tonsillectomy This is different in New York nowa days Still as Dr Muller said the tonsils were not all removed in Philadelphia Anesthetist and surgeon have to see to it that aspiration is reduced to a minimum in these operations

There is no question about it, the diagnosis of abscess of the lung made by the internist and surgeon and supported by laboratory findings can be greatly refined by the radiographist and the bronchoscopist I think the bronchoscopist is the best friend of the patient as well as of the surgeon He can tell us

in detail from which lobe or lobes the pus is discharged whether there are strictures at the entrance to the bronchus etc

It is true that 25 to 30 per cent of these cases of lung abscess get well without any interference but who is able to predict who are the fortunate ones among those patients who will be cured without treatment? Therefore it is wise to treat them bronchoscopically first We have seen acute and subacute cases of this type even a few chronic patients get well under intra bronchial treatment

The plan followed here as said before is the same as that followed by us in New York for several years The patient is seen by the internist and surgeon then by the x ray man and after him by the bronchoscopist Then we all talk it over and decide what is to the best interests of the patient If later on operative treatment becomes indicated the patient passes into *the hands of the surgeon but not before that*

Concerning Dr Muller s remarks on carcinoma of the esophagus I would say that this disease takes in frequency the fifth place of all carcinomas of the body These poor patients are longing for the return of the ability to swallow If we can hold out to them that possibility by means of operation and at the same time are striving for a radical cure it is indeed worth trying

I have stated many times that it has been a misfortune for patients afflicted with cancer of the esophagus that the radical operation was born at the time when deep ray treatment entered therapeutics Inasmuch as the surgeon could not possibly show a series of cases who had recovered after operation these patients were sent to colleagues specializing in ray treatment We had an interesting discussion in Washington on this subject last May It was brought out that radium was of no curative use in this disease Seven or eight years ago Dr H H Janeway, of New York, reported at a meeting of the New York Society for Thoracic Surgery that 37 cases under his care were treated with radium without a single definite improvement Dr Stone reported in Washington last May that not one case of cancer of the esophagus had recovered by the use of radium

at the General Memorial Hospital so far Last summer a colleague in Chicago reported on 100 cases of this kind without tangible results

On the other hand, in New York 3 patients have recovered after the radical operation, 1 of them living twelve years, able to partake of food, liquid as well as solid

Carcinoma of the esophagus is a local disease—just as all cancers are at first—and next to carcinoma of the colon it is the most benign in the body As just mentioned, in more than ten years' practice and observation it has been found out that radium cannot cure it The pendulum, therefore, has to swing back to operative surgery If we get these cases early enough radical operation offers them a good chance

Early operation requires early diagnosis The doctor who sees these patients first is the deciding factor It is up to him to see to it that they get into the hands of the specialist before it is too late Patients with difficulty in swallowing are urgent hospital cases At the present time the great majority come too late and the surgeon who dares to go ahead is, of course, often disappointed with his results But he should be persistent and try again and again, and help in impressing upon profession and laity the absolute necessity of considering difficulty in swallowing, recently observed, a symptom of greatest importance for the patient's future Early diagnosis and early operation are the goal

THE TREATMENT OF SUPERFICIAL BURNS

DR I S RAVDIN

Several years ago Dr L K Ferguson and myself began our work on this subject We have elaborated a method of treatment which we believe rational, and which has given us gratifying results

The method which I wish to present is based upon what we know occurs in these cases from both laboratory and clinical investigation If one anastomoses the distal end of the cut

femoral vein of a dog whose leg has been burned to the proximal end of the cut femoral vein of an unburned dog toxic symptoms become manifest in the unburned dog The injection of citrated blood from a burned patient produces toxic symptoms in an otherwise healthy individual Removal of the burned skin within several hours after burning the dog s leg prevents the appearance of toxic phenomena Removal of the burned tissue more than eight hours after the receipt of the burn does not prevent the appearance of toxic symptoms Many other experiments could be described but suffice it to say we have found that within all likelihood the toxins are the result of the action of heat upon living skin that muscular tissues after destruction by heat do not elaborate a toxin as destructive in its action as that produced after a superficial burn, and that beyond the part which it plays in the production of the primary shock, the nervous system has only a secondary role in the production of the demonstrable symptoms

We have divided our treatment according to the stages of the burn The first stage encountered is that of the primary shock, the second that of the toxemia, the third that of infection and the fourth that of repair Of course infection may not occur and the stage of repair may follow that of the toxemia

From clinical observation it is easy to understand the production of the primary shock The violent stimulation of somatic sensory fibers is sufficient to account for the gravity of the symptoms These patients are as a rule admitted to the hospital with a subnormal temperature a rapid running pulse and a low systolic blood pressure We found that some of the cases treated along the usual lines for shock did not recover as they should There had been no loss of blood, as such and the indication for transfusion either with saline or blood was not at once apparent Let us then consider the cause of prolonged shock in some cases

The burn produces an acute inflammatory process Capillary dilatation results with increased permeability of the vessels Exudation of fluid occurs with a resulting anhydremia The burn need not be deep, in fact, fluid loss does not occur in the

extensively charred burns to nearly the degree with which it occurs in the extensive second degree burns. This fluid loss is associated with an increased viscosity of the blood. It is well known that an increase in blood viscosity in itself causes a fall in the systolic pressure. Thus the two factors, peripheral sensory overstimulation and fluid loss, act in a vicious circle to prolong the stage of shock.

The water concentration of the blood which occurs in many of these cases was admirably studied by Underhill and his associates, at Yale, and those interested in this aspect of the subject will do well to read their article which was published in the Archives of Internal Medicine in July, 1925. Although we have never seen water concentration of such a severity as to cause a hemoglobin of 145, we have observed a hemoglobin of 125.

Peripheral vasodilatation also results in heat loss. Extensive heat loss will occur following wide-spread burns, even those of the first degree. This factor again assists in prolonging the initial shock. Three factors must then be considered in outlining the treatment during this stage; the relief of pain, the restoration of blood volume, and the counteraction of heat loss.

In the beginning of our work we began the use of novocain packs in an effort to produce analgesia. The initial attempts were so successful that this procedure was adopted as a regular part of our technic. One per cent. novocain is used, and we find that the pain is adequately controlled without the use of *any narcotic. This is as true for children as it is for adults.* Heat loss is counteracted by keeping over the patient a cabinet fitted up with a series of electric lights. The temperature is maintained at 100° F. The fluid loss is restored with water administered orally. Even children will drink large quantities of it, and we have never found it necessary to give hypodermoclysis, enteroclysis, or intravenous saline except in the late cases. Water taken by the oral route rapidly restores the plasma volume, decreases the blood viscosity, and there results an elevation of the systolic pressure.

If our premise is correct, that the toxins are the result of the action of the burn on living skin we feel that the prevention of toxin absorption should largely prevent the second stage so frequently observed Two methods are available to prevent the appearance of toxic phenomena The first and best is removal of all devitalized tissue leaving behind healthy non toxin producing tissues However this is hardly possible in extensive burns as a primary procedure since the operation itself is shocking and in a patient just reacting from shock the condition may be re established and death result. All superficial necrotic tissue is removed as soon as the patient is quiet but extensive excision is now reserved for a later date

How then can we prevent toxin absorption until such time as excision is advisable? We believe this can be accomplished by the use of drugs having a peripheral vasoconstrictor action The drug selected is adrenalin When we began to use it we did not know of the work of Douglas on the alteration of rate absorption in the capillaries The initial solution contained 1 part of adrenalin to 25 parts of novocain We now use it in a strength of 1 10 With the use of adrenalin we can control the absorption of any deleterious products Thus the inception of the toxemia is delayed When the condition of the patient is satisfactory he is anesthetized and the destroyed tissues are removed Not only is late excision preferable because the danger of re-establishing shock is largely overcome but at this time the actual dividing line between dead and living tissue is more clearly defined and the excision is more thorough with less hemorrhage *and less trauma*

After debridement we use normal saline dressings but if the patient complains of too much pain we use the novocain packs The electric cabinet is kept over the patient for a variable period In children we find difficulty in removing it since its *glowing warmth makes them so comfortable* We *have kept* it on well into the period of convalescence If infection occurs we use mercurochrome packs These have the advantage of not causing any crusting which invariably occurs when dichloramin T is used

When the granulation tissue is sufficient and the area is large skin grafting is resorted to Thiersch or whole thickness grafts are much to be preferred to the Reverdin grafts This is especially true at the flexures For smaller areas zinc oxid adhesive strips often suffice

In the recent burns admitted to the University Hospital since September, 1923, and treated by the method outlined, no convulsions have been observed In one case in which treatment was delayed after admission and in another admitted several days after receipt of the burn convulsions occurred Several cases admitted late were delirious All of these cases were treated by exsanguination transfusion after the method of Robertson and Boyd of Toronto This is a simple procedure and will save many cases otherwise doomed Thirty c c per pound of body weight are removed and about 35 c c are introduced The exsanguination must be thorough in order to obtain good results

The results of biochemical examinations of the patient s blood may be interesting We have never found a plasmocarbon dioxid which would indicate an impairment of the carbon dioxid combining power of the plasma Acidosis is, therefore, not a part of the clinical picture in these cases and sodium bicarbonate is contraindicated The blood urea nitrogen bas never been over 25 mgm per 100 c c, even in the very late cases Uremia is not the cause of the toxic symptoms which the patient presents Furthermore, we have been unable to confirm work recently published which showed an increase in the non protein nitrogen of the blood In these cases, properly treated from the beginning, nephritis plays no part in the picture A transient albuminuria occurs, but never a urine picture which would lead one to the diagnosis of an acute nephritic inflammation

Thirty eight cases have been treated by the method outlined with 4 deaths The majority of the cases have been in children, in whom the mortality is usually high

BLOOD TRANSFUSION METHODS

DRS JOHN A KOLMER AND I S RAVDIN

DR KOLMER As is well known the subject of blood transfusion has attracted a great deal of attention in the last few years and it is interesting to glance back over the history and see that while the ancients referred to it in certain of their writings the first real transfusion was done in England at Oxford University by Lohr 1660–65 At that time he succeeded in transfusing blood from one dog to another by means of a goose quill

Sir Christopher Wren and Archibald did their first transfusion two years later on a debauched man they brought in from the streets who allowed 12 ounces of sheep s blood to be transfused into him The records show that the man was shown before the college twelve days later living and in good condition

In 1835 Bisbop introduced the method of the transfusion of defibrinated blood and from then until the early eighties the general feeling was very much in favor of this method However it was shown to be a very dangerous one and the pendulum then swung in the other direction and transfusion was resorted to only occasionally until Crile renewed interest in it in 1898

In 1915 the citrate method was devised by D Agote of Montpelier and Lewisohn of New York has done much to make it popular

My idea is to review the diseases in which blood transfusion is of the most use These may be divided into five or six distinct classes

1 Severe hemorrhage where there has been sudden and severe loss of blood

If our purpose in transfusing is merely to restore blood volume this could be accomplished by simple saline solution but this not being colloidal will rapidly diffuse and only restore it for a variable period of time In the treatment of severe hemorrbage the indications are not only to restore the blood volume but to correct other disturbances as there is also a

reduction in the elimination of waste products from the loss of hemoglobin If no blood is available a solution of 6 per cent acacia and 1½ per cent of gelatin can be used and properly prepared it is superior to simple saline solution

I do not want to discuss the question of when to transfuse In hemorrhage it is a life saving procedure in certain stages and while it will not always serve to maintain life we must realize that other measures have failed as well

2 The second class of cases in which blood transfusion is applicable is in cases of hemorrhage due to ruptured tubal pregnancy or ruptured gastric duodenal ulcer with great loss of blood or rupture of typhoid ulcer the accidents of pregnancy and the accidents of delivery I believe we would also do well to type our puerperal cases in order to be ready to transfuse any who require it due to the accidents of pregnancy

3 The third class of cases is hemorrhage of the purpurics, if hemorrhage from the bowel or any other part of the body can not be checked then resort to transfusion In purpuric hemorrhage small transfusions are as good as large ones

4 Hemophilias My experience with these patients has been that blood transfusion will stop the hemorrhage in the subcutaneous tissues or in the joints or even in the peritoneal cavity My advice to hemophiliac patients is to take an intramuscular injection once a month I have 2 children under my care now in one of which this procedure is preserving the child from hemorrhage Once a month the child gets 20 c c injected into the buttocks before it has time to coagulate Rarely more than 50 to 100 c c is given to these patients at one transfusion I believe it is a good idea to tell hemophiliacs the blood group to which they belong and if possible give them the addresses of one or more compatible donors on whom to call in case of emergency

5 Next come the diseases of the blood and foremost among these is pernicious anemia In addition we must consider leukemia We have used transfusion in pernicious anemia more than in any other single disease but we are still in the dark as to its cause I believe all data on the subject points to the exist

ence of an infection but where it resides we do not know We cannot help but suspect the spleen and when we section them in these cases we do find active blood destruction That has led to the belief among many that the spleen should be removed in these cases but statistics on this point are by no means convincing Krumbhaar in making a study of operations for removal of the spleen in cases of pernicious anemia reports that the mortality is 20 per cent and that improvement was liable to be very slight or transient In 3 cases I studied I found it did not help to remove the spleen It may be that the blood we transfuse has some destructive effect on the hemolytic agents in addition I believe that it temporarily stimulates the bone marrow to blood regeneration I do not think that nowadays any of us would attempt to treat a case of pernicious anemia without the help of blood transfusion I think 200 c c does as much good as 800 c c in these cases but we do not attempt to lay down a definite plan of transfusion as we believe in each case a particular line of treatment will be indicated If there is a positive Wassermann reaction the chances are good I give neo arsphenamin in cases presenting a picture of pernicious anemia due to syphilis and believe that in some cases the reported recoveries have been in cases of syphilitic anemia Even in the presence of a negative Wassermann I believe we should give arsenic In one case of pernicious anemia treated by the citrate method we added some neo arsphenamin to the 200 c c of citrated solution and there was no increased tendency to reaction

6 The last group in which it is useful is the staphylococcic and streptococcic infections I have seen some cases of severe streptococcic infection recover with blood transfusion If we find by culture that the blood is heavily infected with streptococcus we might wisely practice exsanguination transfusion When the patient can stand this we think there is something to be gained by transfusing fresh blood In cases of sepsis treated by transfusion I think we should expect results particularly if there is time enough to immunize the donor I sometimes give the donor three doses of vaccine at daily intervals 200 to 500

million bacteria at a time, five days after the last dose the blood is ready for transfusion It will certainly help to combat the invasion I think the same thing is true where staphylococcic infection is present although I believe this latter infection is more dangerous than pneumococcus or streptococcus septicemia We have no antiserum for it, and when we find it present we should consider blood transfusion and the use of mercurochrome or gentian violet or one of the other agents, in my own experience mercurochrome has been the best of the dyes

7 In addition to the above I think blood transfusion is of help in case of acute poisoning, after gas poisoning, etc , I think it is well to practise exsanguination transfusion

Remarks by Dr Ravdin This is a case of secondary anemia being treated by the citrate method of blood transfusion

We use a large aspirating needle with a piece of rubber tubing attached We never use a glass rod to stir the blood because we believe it injures the corpuscles We use a number of different methods for blood transfusion We have used the Kimpton Brown tubes and the Percy tubes, then we used the Unger apparatus and then the large 100 c c syringes After trying them all we have gone back in a majority of our cases to the citrate method We find that we have as few reactions with it as with any other method and as few as by any unmodified blood method We use a chemically pure sodium citrate solution which is made up just before the operation The citrate should be of reagent purity To be so called "pure" is not enough The free lead and iron present in many commercial citrates contraindicates their use The citrate is surely a cause of many reactions Furthermore the solution should be made up with freshly distilled water and should be sterilized only once Repeated sterilization results in deterioration and this, again may cause reactions

Only a few cubic centimeters of the citrate solution is put in the Erlenmeyer flask into which the blood flows The remainder is added as the blood is obtained To put all the citrate in at the beginning is to invite hemolysis The flask is

gently agitated to obtain adequate mixing of blood and anti coagulant

As soon as the blood is obtained it is placed in a basin which contains sterile water at body temperature This prevents clotting of the blood We give the blood extremely slowly, and believe this is important We use a No 16 needle on the patient If it is essential to cut down on the vessel we use the saphenous vein We use the Kauffman Leur syringe in giving the blood It has many advantages in that we can accurately tell whether or not we are within the lumen of the vein

Remarks by Dr Kolmer In connection with some of the points Dr Ravdin has mentioned I would say that in the use of the Lewisohn method the incidence of reactions with us has been higher than with the direct method I believe that em phasis should be laid on the necessity of using a chemically pure citrate and having it made up fresh just before the trans fusion I believe it is also important to give the transfusion slowly as this method is followed by fewer reactions I think the good citrate transfusion is to be preferred to a poor direct transfusion As to the Lumpton Brown tubes every once in a while something goes wrong with them before an adequate amount of blood has been transfused The citrate method renders blood transfusion easy for any physician who can give an intravenous injection It is not confined to use by a few

We don t know what produces the reaction from blood trans fusions Some individuals have lost their lives as a result of this reaction and we are at a loss to explain this mechanism On the other hand it cannot be denied that after we take blood from one person and put it in a glass syringe for transfer to another person certain colloidal changes can occur before the transfer is actually made It has been shown that blood taken from one guinea pig and injected into another has resulted in toxic reaction Drinker believes that citrate may favor hemol ysis and it has also been stated that sodium citrate may reduce the complement of the blood although the evidence is not con vincing Reactions after transfusion not due to hemolysis are

due to colloidal disturbances which we understand poorly or not at all; but in the citrate method I believe the absence of defibrination and the use of chemically pure sodium citrate are of importance.

Then, too, we may get reactions from new rubber tubing, and it is wise, therefore, to soak rubber tubing overnight and wash it. The substances given off by new rubber are liable to produce toxic reactions I believe that a good citrate method is by all odds the best method for blood transfusion if it gives no reaction, but if we have a patient who is terribly ill and we think he is just on the brink and could be pushed off by the reaction from a transfusion, then I think the preference has been for the direct method.

The proportion should be 10 c c. of a 3 per cent. solution to each 100 c.c. of blood; this being used by Dr. Ravdin is only a 2 5 per cent. solution.

Another point to be remembered is that we sometimes approach a donor with enough citrate to take care of 500 c.c. blood and only get 200 c.c. from him. I think we should have just enough citrate to take care of 200 c.c. and then add more citrate as required. How toxic is citrate? My experience has been that we can give an individual a much larger amount than is administered in a citrate transfusion without producing toxic symptoms.

Remarks by Dr. Ravdin: The next case is one of a vague primary anemia which in many ways resembles aplastic anemia. She has, however, improved very much following the last two transfusions, and we are repeating the operation in order to prepare her for cholecystostomy. She has had persistent tenderness and pain over the gall-bladder region, and Drs. Riesman and Muller believe the gall-bladder infection may be causing the anemia.

I have 2 patients here whom I wish to show. The first is a boy now three and a half years old, who at thirty months of age had a streptococcus septicemia. Exsanguination transfusion was practised six times, with favorable results It was surpris-

ing to see the reduction of streptococcic colonies on the blood agar plates from blood removed forty eight hours after each exsanguination transfusion He is now well and happy even though he developed a parotid abscess an empyema an abscess of the chest wall and a dislocated hip from relaxation of the hip joint

The second case is one of hemophilia He was operated on a number of times for recurring hemarthrosis of the knee joint Suppuration finally occurred requiring amputation At this time his condition was desperate The patient continued to bleed after amputation and we seemed unable to stop the hem orrhage In all he had thirty three transfusions with final recovery It is now seven months since discharge from the hospital and there has been no further hemorrhage and we believe he is well

Remarks by Dr Muller Recently I saw a patient with Dr Riesman in whom I aspirated the shoulder joint for suppura tive arthritis Dr Kolmer immunized the son and did several blood transfusions and the patient got perfectly well after the transfusion in that particular case the primary focus was in all probability an abscessed tooth which showed some type of strep tococcic infection which we found in the material aspirated from the joint

This morning we are showing a little patient who had a thoracotomy performed last Tuesday An inter rib puncture was first done and then a thoracotomy The child s tempera ture has not declined as it should and since it has an advanced secondary anemia we have thought it better to do a transfusion

Remarks by Dr Ravdin The superior longitudinal sinus may be used in children but this route may be attended by some hazards I prefer the intraperitoneal route to that of the sinus It is attended by small risk and the success of the intro duction of the blood is sure In this child we will introduce the blood through the median basilic vein An especially small cannula is used so that the vein is not torn In this little patient

the unmodified method could not be used We will introduce only 200 c c , since we do not want to overload the circulatory system

These debilitated patients do very well after the introduction of blood One transfusion may not suffice, but he who persists in its use will rarely regret his actions, and many patients who otherwise might succumb can be restored to health and usefulness

SYMPOSIUM ON CHRONIC GALL-BLADDER DISEASE

SYMPTOMS AND DIAGNOSIS

DR DAVID RIESMAN

Disease of the gall-bladder and biliary passages is a subject demanding the closest co operation of the physician, the surgeon, and the laboratory worker Only by joint effort can many of the perplexing problems in this domain, which I would call the "Balkans of the body," be solved *

In approaching the subject it must be remembered that disease of the gall-bladder is rarely a unitary affection—usually it is associated with changes, functional as well as structural, in the liver, pancreas, and in the gastro-intestinal tract Heyd has shown the frequency of hepatic disease, and Deaver has pointed out the importance of changes in the pancreas and in the regional lymph-nodes The functional changes in particular need greater study than they have hitherto received Furthermore, the gall-bladder, acting as a site of focal infection, may become the cause of disease at a distance in the joints, and, as I pointed out several years ago, in the myocardium [1] Jaundice, if it occurs, adds still other symptoms, so that the picture of disease of the gall-bladder may become a very complicated one that cannot be correctly approached by the anatomic pathway only

I shall first take up the subject of gall-stones about which, notwithstanding a voluminous literature, much remains un-

* On account of the frequent turmoil in the right upper quadrant of the abdomen, I have called that region the "Balkans of the body "

known The infectious theory of their formation pretty widely accepted has recently been attacked by Rous and McMaster on the strength of ingenious animal experiments There is certainly one type of stone—the true cholesterol stone—that seems to have no infectious basis It is however a rare type Much more frequent are calculi composed of pigment and lime salts and in them living bacteria have been found In a case reported by Moynihan typhoid bacilli were found twenty eight years after and in a case of Finney thirty two years after the original attack of typhoid fever

More important than the occasional finding of bacteria entrapped in stones is their isolation from the wall of the gall bladder in cases of gall stone disease particularly the isolation of the Bacillus coli This has been successfully accomplished in 46 per cent of cases in a series reported by Moynihan The majority of gall stones are the result or the sequel of an antecedent infection of the gall bladder Such infection may be brought about by formidable diseases like typhoid fever influenza pneumonia puerperal fever but also perhaps by more trivial conditions such as focal infections in the teeth the tonsils the sinuses etc

The greater frequency of gall stones in women who have borne children has never been adequately explained but it seems reasonable to attribute it to infection during pregnancy The colon bacillus may reach the gall bladder from slight infection in the urinary tract which is very common in pregnant women and may set up an inflammation in the gall bladder which constitutes the groundwork of subsequent stone formation If this is the correct explanation then it must be admitted that stones can form in an apparently short space of time for colicky attacks sometimes occur during the first pregnancy or soon after the first labor

The French School holds to a cholesterol diathesis or cholesterolemia the importance or existence of which several American observers do not confirm Moynihan on the other hand has just published studies of his associate Dr Celia Striskin who found hypercholesterolemia in 65 per cent of gall bladder

cases. The normal cholesterol content of the blood is usually given as from 140 to 160 mg. per 100 c.c. of serum. Striskin considers everything above 192 mg. per 100 c.c. as indicating hypercholesterolemia.

Boyd by a special method has demonstrated cholesterol deposits in the walls of diseased gall-bladders removed surgically, and believes this to be the pregall-stone stage. He has found it in the majority of so-called strawberry gall-bladders.

Whatever we may think of the cholesterol diatbesis, it must be admitted that there is some relation between fat metabolism and stone formation, for in countries where little fat is consumed gall-stones are rare.

There are two main types of gall-stones:

A. Single stones often composed of cholesterol.

B. Multiple stones composed of calcium carbonate, pigment, and cholesterol. This type is definitely infectious in origin. While multiple calculi may originate from multiple foci or nuclei, it is also possible that they may result from the breakage of a large stone.

Gall-stones occur most frequently in women above the age of thirty-five who are of stout build and lazy habits, but—and this point needs emphasis—they also occur in men and in persons of either sex who are of spare build and active temperament. I have in mind a man by no means stout, a very active golf player, who has had an operation for gall-stones and infected gall-bladder. Furthermore, the prevailing idea that cholecystitis is a disease of middle life is wrong, for it is quite frequent under the age of thirty and occurs even in children. In persons under thirty pregnancy and the puerperal period seem usually to have a direct relation to the gall-stone attacks. Eusterman has recently reported from the Mayo Clinic 117 cases of gall-stones and gall-bladder disease in young persons.

Cause of Gall-stone Seizures.—Attacks of biliary colic or gall-stone colic are brought on by a variety of circumstances—by chilling of the surface, an imprudent or hasty meal, overfatigue, menstruation, and labor. At times they come on with-

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disease of the gall bladder is present or not It does not by itself prove the existence of stone

8 Stones may sometimes be found in the stools and might be found oftener if systematic search were made for them

9 Jaundice occurring after a severe attack of pain is strong evidence in favor of stone It is, however, not positive proof According to medical text books jaundice occurs in about 10 per cent of cases Surgical statistics give the figure as about 30 per cent Personally I believe jaundice is more frequent than is usually taught by medical writers If we ask the patient "Did you have jaundice or were you yellow?" he or she may answer in the affirmative as many interpret a sallow livery color as jaundice By asking "Were your eyes yellow?" a more reliable answer is obtained I have however, found that when the answer is negative or equivocal, the patient often stated in reply to the query regarding the color of the urine, that for several days he or she noted that the urine was strikingly dark In that case I put those patients down as having had jaundice

10 The researches of van den Bergh, Alice Bernheim, Eliza beth Rawdin, and others have shown the existence of latent icterus, a concentration of bilirubin in the blood above the normal (normal 1 to 400,000) In this condition neither the eyes nor the skin shows any trace of jaundice As such a bilirubinemia is sometimes found during attacks of biliary colic and not in the intervals and usually not in other conditions with which gall bladder disease may be confused, the van den Bergh test or one of its modifications is worthy of routine clinical use

Normal icterus index as it is called (Alice Bernheim, North American Surgical Clinics, February, 1925), is from 4 to 6, in jaundice it is 15 or above, and in latent jaundice, from 6 to 15 In 31 cases of cholecystitis and gall stones with no history of jaundice, the icterus index ranged from 7 1 to 15, with an average of 11 5

11 Biliary drainage, if it reveals a large amount of cholesterol crystals in the bile, points to gall stones

A severe attack of biliary colic in a patient who has never

had any dyspeptic or colicky symptoms is suggestive of a single stone engaging in the cystic or common duct The abrupt cessation of pain is a sign that the stone has slipped back into the gall bladder

CHOLECYSTITIS

Cholecystitis may occur as an independent affection that is independent of stones I have pointed out earlier in this article that it probably antedates the formation of gall stones in the majority of instances The presence of stones is however a very important predisposing cause of inflammation of the wall of the gall bladder so that a vicious circle may be said to exist

Cholecystitis is not infrequent as an acute affection occurring during the course of typhoid fever influenza pneumonia septicemia, etc It is usually accompanied by jaundice and by enlargement and tenderness of the liver If the patient recovers the condition subsides completely as far as any evidence of inflammation of the gall bladder is concerned yet it may lay the foundation for subsequent stone formation

Cholecystitis may be secondary to areas of focal infection In such cases it is rarely severe or virulent but presents itself as a chronic condition with a tendency to acute exacerbations

The clinical features of acute cholecystitis are pain in the right upper quadrant tenderness fever vomiting leukocytosis and usually a moderate enlargement of the liver

It may be difficult to decide whether the enlargement is the liver itself or the so called Riedel s lobe or the swollen gall bladder In some cases the gall bladder can be seen through the abdominal wall by resorting to the following procedure The pillows are removed and a rolled up blanket or sand pillow is placed under the patient s back The physician crouches down so that his eyes are on a level with the patient s abdomen then when the patient takes a deep breath the fundus of the gall bladder may be seen as a rounded swelling sliding under the skin and with a very gentle touch of the warm hand it may even be felt

CHRONIC CHOLECYSTITIS

The history is usually one of grumbling pains or of steady soreness in the right side, made worse by exercise; gaseous distention, heart burn, and epigastric discomfort. The patient is afraid to eat; his appetite, though good, is readily satiated. The symptoms are indefinite and are in a general way common to peptic ulcer and to gall-bladder disease. However, the age of the patient, the long duration of the symptoms, the resistance to dietetic measures, and the indefiniteness of the picture are suggestive of disease of the gall-bladder.

Physical examination is of great value if it reveals a tender point in the region of the right upper rectus muscle. This tenderness may be found anywhere from the inner border of the right upper rectus to the right flank. There are several ways of eliciting it.

1 I have already spoken of the method of the rolled-up blanket, which is of particular value in acute cases.

2. A firm pressure with the thumb below the right costal border while the patient is taking a deep breath.

3. The technic of Mann: The patient sits on a chair thoroughly relaxed, leaning forward, with arms hanging by his side. The examiner standing behind the patient presses his hand up under the ribs.

4. A method described in the Journal of the American Medical Association*: The patient, lying flat on his side, is told to take a deep breath, at the height of which the examiner gives a quick blow with the ulnar side of the right hand below each costal border. This usually brings out any tenderness that may be present in the gall-bladder area.

In some cases of chronic cholecystitis the symptoms are those of nervous dyspepsia, with little or no actual pain, with only general discomfort in the upper abdomen, with belching independent of meals, poor appetite and fear of taking food, nausea, regurgitation of food, and at times spontaneous vomiting. Patients with these complaints are often treated by rest cures and by gastric lavage, but when they finally come to

* Ruesman, Jour. Amer. Med. Assoc., June 24, 1922.

operation they are found to have either an inflamed thick walled gall bladder or a contracted bladder filled with stones It is by no means uncommon to find this complex picture in women who are not stout who are subject to visceroptosis whose make up suggests ulcer rather than gall stones or gall bladder disease Very often it is the indefiniteness and the chronicity of the symptoms which with a careful physical examination finally lead to a correct diagnosis

Bancroft speaks of two types of chronic cholecystitis

1 That in which the muscularis and the submucosa are infiltrated with small round cells but in which the villi are relatively normal in appearance

2 The so called strawberry gall bladder with thickened knob like villi containing cholesterol in large quantities with ulceration of the tips of the villi and scar like formation in the connective tissue This type may be the precursor of stones

I have spoken of x ray examination in the diagnosis of chronic types of gall bladder disease The x ray may reveal stones it may show an enlarged gall bladder it may also show adhesions that indicate an old pathologic process F W White classifies these adhesions as follows

1 Those that pull the stomach to the right and perhaps deform the antrum or pyloric region

2 Adhesions deforming the first and second portions of the duodenum

3 Adhesions holding coils of the jejunum in the right upper quadrant

4 Adhesions lifting or holding up the hepatic flexure in the gall bladder region

A chronic diseased gall bladder especially one in which stones are present may become the site of acute suppurative processes—empyema of the gall bladder a very serious condition Operation in such cases has a high mortality It is therefore important to prevent such complications by timely surgical interference Death usually results from toxemia or liver shock It may occur immediately after operation or at a later period through some obscure damage to the liver or to the

pancreas It is not always possible to fathom the cause of death It is in cases of this type as well as in those with jaundice that preoperative treatment as described by Crile and others is of the greatest value

DIFFERENTIAL DIAGNOSIS

Nothing is more difficult at times than to tell what is going on in the right upper quadrant of the abdomen Disease of the gall bladder may be simulated by peptic ulcer, especially by duodenal ulcer, moreover the two may coexist and produce a very confusing picture In the diagnosis of duodenal ulcer the *x* ray is of the greatest value Gastric analysis may also prove helpful In ulcer the acidity is usually increased, while in gall bladder affections the acidity is most often normal or diminished, although cases with hyperchlorhydria occur Gatewood* found achlorhydria in 30 per cent and hypo acidity in 15 per cent of his cases Mussey and Brockt found

In cholecystitis without stones

Achlorhydria 17 per cent
Hypo acidity 16 per cent
Normal acidity 55 per cent
Hyperacidity 12 per cent

In cholelithiasis

Achlorhydria 24 per cent
Hypo acidity 20 per cent
Normal acidity 47 per cent
Hyperacidity, 9 per cent

Appendicitis —If the appendix were always in its proper place there would be little difficulty but as it enjoys considerable freedom it sometimes points upward lying behind the cecum and ascending colon Its inflammation will then simulate gall bladder disease Furthermore there is a distinct relation between disease of the appendix and disease of the gall bladder Dewer for example found disease of the appendix in 90 per cent of gall bladder cases

* Jour Amer Med Assoc 81 904 1923
† Hartman Mayo Clinic xiv 1922

In the diagnosis we may obtain help from the leukocyte count from rectal examination and from the presence of tenderness in the loin which is more frequent in cases of retrocecal appendix than in gall bladder disease

Carcinoma of the Pancreas—This is a very troublesome differential diagnosis Cancer occurs a little more often in persons of the male sex It is usually painless at least in the beginning and is accompanied by an enlargement of the gall bladder the so called Courvoisier's sign I have thought at times that the early appearance of itching was more suggestive of cancer of the pancreas than of stone The jaundice in cancer of the pancreas is persistent it does not get any better it may become more marked while that due to a stone in the common duct may vary in intensity due to the ball valve action of the stone

Visceroptosis—Patients with profound Glenard's disease often suffer from pain in the upper abdomen Such pains are due usually to a dragging sometimes to a twisting of the right ureter (Dietl's crisis) to gaseous distention etc Many of these unfortunate patients are subjected to operation usually without relief A proper abdominal support regulation of the bowels and overfeeding are far better methods of treatment than operation

Angina Pectoris—To the lay mind the possibility that angina pectoris and gall stones might resemble each other in their clinical manifestations is inconceivable yet it happens and it is well to bear this possibility in mind In some cases the anginal symptoms are secondary to the disease of the gall bladder which acts as a site of focal infection In other cases the picture is confusing and one may be dealing with disease of the gall bladder or with angina pectoris with anomalous reference of the pain A careful history and a careful physical examination will avoid error

I have mentioned in an earlier part of this article the fact that myocarditis may be secondary to disease of the gall bladder The importance of this is that when such a relationship can be demonstrated the heart disease is not a contraindication to operation but is really a justification of it and with the removal

of the infected gall bladder the cardiac symptoms as I have seen more than once may promptly disappear

Coronary Thrombosis —This affection which is attracting a great deal of attention at the present time may produce symptoms suggesting an acute catastrophe in the upper abdomen such as perforation of an ulcer acute pancreatitis or a violent attack of biliary colic I have seen several cases in which the diagnosis of duodenal ulcer or gall stone had been made The following features characterize sudden coronary occlusion Intense agonizing pain not controlled by morphin shock with violent drop in blood pressure intense angor animæ slight fever leukocytosis and at times a pericardial friction sound Careful examination reveals the absence of abdominal tenderness and of muscle defense Further evidence is sometimes furnished by absent pulse in the dorsalis pedis artery demonstrating the existence of arterial disease The history may also supply facts suggestive of previous attacks of angina pectoris

Pneumonia and Pleurisy —In a recent article on pneumonia I pointed out the fact well known to clinicians that in the beginning pneumonia may closely resemble either appendicitis or gall bladder disease The same thing is true of pleurisy By making it a rule to examine the chest thoroughly in every case of acute abdominal disturbance mistakes will be avoided

Renal Calculus —The radiation of the pain the presence of bladder disturbance and *x* ray examination may help in the diagnosis

Dietl s crises already mentioned at times closely resemble biliary colic I have even seen jaundice produced by a floating kidney though a drag upon the tissues in the region of the hepatic fissure The physical habitus of the patient the discovery of a loose kidney and the relief by a proper support are the diagnostic criteria

Gastric Crises —Gastric crises of locomotor ataxia are often mistaken for biliary colic a mistake that has led to numerous useless operations It is well in cases that are not typical gall bladder attacks to study the reflexes and the station and to make a Wassermann test Attacks of gastric crises are peculiarly

monotonous in their recurrence both as to symptoms and as to duration This fact in itself should arouse suspicion as to the true nature of the seizures

Gall-bladder Disease and Diabetes —Owing to the progress in our knowledge of diabetes surgeons have in the last few years lost their traditional fear of operating upon diabetic patients Operation in cases of cholecystitis has at times led to a disappearance of the diabetes probably because the removal of the infection in the gall bladder has relieved the pancreas of a burden

My part in the symposium today does not include a discussion of medical treatment It might even be dangerous to speak of medical treatment of diseases of the gall bladder in the presence of an assembly of surgeons I shall, however risk making one statement the gall bladder should not be treated by the surgeon like the appendix first because it is a more useful organ and second because its acute inflammations are, as a rule far less serious

BIBLIOGRAPHY

1 Riesman Jour Amer Med Assoc May 11 1907 Amer Jour Med Sci November 1911
2 Moynihan British Med Jour February 28 1925
3 Boyd British Jour Surgery 337 1923
4 Mann Mayo Clinic
5 Bancroft Surgical Clinics of North America February 1925
6 F W White Medical Clinics of North America

LABORATORY TESTS

DR ELIZABETH G RAVDIN

In estimating the functional value of an organ it is usually possible to measure the efficiency of that organ by one or two tests and to get some idea of its functional capacity The more *complex the function the more difficult it is to obtain this* knowledge A urinalysis and phenolsulphonephthalein output estimation give us a fair idea of kidney function The liver on the other hand, plays many roles in the body metabolism, and for this reason investigation of liver function presents many

difficulties that are not met in an estimation of the function of other organs.

It is not probable that one or two tests will ever measure the actual function of the liver, but it is possible that a single test may indicate liver damage of an extent to involve all its activity. No test that we have at the present indicates slight damage. The great reserve of the liver allows normal function to proceed in the face of slight derangement

Our present tests may be divided, according to function, into:

1. Those which measure metabolic activity, as the levulose test.

2. Those which measure the detoxifying power, as the glycuronic acid test.

3. Those which measure the relation of the liver to the blood, as the hemoclastic crisis; and blending with this group:

4. A fourth, which indicates pigment metabolism:

(*a*) The van den Bergh test

(*b*) Fouchet's test.

5. The excretory function of the liver, as the phenoltetrachlorphthalein test.

Of all these, the ones which seem most sensitive to slight liver damage we believe to be those concerned with pigment metabolism, with excretory function and possibly with carbohydrate metabolism.

For many years gross lesions of the liver involving pigment excretion have been recognized because of the obvious symptom of jaundice. The division of jaundice into the choluric and acholuric types has also long been recognized. Acholuric jaundice as seen in icterus neonatorum, familial ictero-anemia, and certain toxic conditions means that a relatively large amount of bile-pigment is present in the blood, but that none escapes in the urine. The choluric jaundices, as in common duct obstruction, are evidences of gross obstruction or hepatic disease, with bile-pigment in the blood and in the urine.

A test to measure slight pigment derangement is of comparatively recent development. The van den Bergh test, by which the bilirubin content of normal blood-serum can be

determined in a dilution as high as 1 to 1 000,000 first came into prominence in 1919, and it is this test in which we are at present most interested It is more delicate than the Souchet or Gurellin test, and is specific whereas the Munlengracht or icterus index is a measure only of serum color

The van den Bergh test depends upon the development of an azo dye, azobilirubin when an acid solution of a diazonium salt is added to a solution of bilirubin Proscber in 1900 iden tified and isolated this dye and van den Bergh and Schnapper applied the reaction clinically in 1913 The latter workers found that pure bilirubin in a dilution of 0 7 mg per liter in alcoholic solution gave a positive reaction This was the first step in the study of early stages in diseases in which changes in the con centration of bile pigment in the blood occur

The test is divided into two parts—a direct or qualitative and an indirect or quantitative

The direct test is done by adding the diazo solution directly to the serum It may result in one of three ways

(1) The immediate direct there is development of color in from ten to sixty seconds When this occurs the bilirubin is believed to be present in the form in which it occurs in the bile and an obstructive jaundice is indicated

(2) The delayed direct and the negative direct either of these results may be obtained when the bilirubin is of hemo lytic origin or non obstructive This form is found in the anemias and in chronic calculous cholecystitis The color develops slowly after one or two minutes or not at all

(3) The biphasic direct This is apparently a combination of the two preceding reactions There is an immediate direct reaction, with later developing increase of color It should be pointed out that the absence of a biphasic reaction does not mean that only bilirubin of the obstructive form is present for *often the hemolytic form gives no direct reaction*

All forms of bilirubin react in the presence of alcohol and give a positive indirect reaction, therefore the indirect reaction is purely quantitative The normal serum has been found to

contain bilirubin in a concentration of from 1 to 3 mg per liter, or, in terms of units from 0 2 to 0 6 unit

The technic of the test is simple, and has been published previously in detail

From our experience we believe it is of value as an indication of altered pigment metabolism, and we have found it more accurate than other tests for pigment retention

SURGICAL ASPECTS

Dr George P Muller

It is not easy to cover the surgical aspects of this important disease in the short time at my disposal We must first distinguish, if we can, between chronic cholecystitis and gall stone disease Naturally this cannot be done in many instances but it leads us to a certain line of thought If the patient can be relieved of an infection in the biliary apparatus by non surgical measures such treatment is well worth while but I am a little skeptical about the permanency of such cures except in mild cases On the other hand the presence of stones invariably implies that the case is surgical No one has devised a method whereby stones can be dissolved in the gall bladder and Aschoff has shown that certain substances may break up the calculi in the test tube but such an effect in the gall bladder would lead to cystic duct colic from the passage of the fragments

I am uncertain as to how seriously the gall bladder acts as a focus of infection Most of the patients are stout women they experience good health except for gaseous indigestion and the occurrence of more or less frequent attacks of colic The most serious damage is that which is done to the liver and this point has been well brought out in the many papers by Graham of St Louis Alvarez has stated that on the average nineteen years may elapse from the time of the initial onset until the time that the patient is brought to operation If the gall bladder acted as a focus of infection during all this time, it seems to me that more serious lesions of joints, of the kidneys, or of the heart should be manifest than we find in our gall bladder

cases Probably such injury occurs but is slight an increased arteriosclerosis or a kidney degeneration a myocardial weakness or a pancreatitis However last spring I saw a patient with fairly marked rheumatoid arthritis in two joints He had gall bladder symptoms and an infected gall bladder containing stones was removed His joint symptoms cleared up at the end of a month

I think that the Meltzer Lyons test is well worth while as a preliminary treatment for many patients Dr Lyons himself says that he cannot dissolve gall stones cure adhesions or open a cystic duct obstructed by a stone but from an experience of six or seven operations on patients referred by him during this year I believe that preliminary bile drainage is well worth while and that on the average these patients all jaundiced have done better than patients not so treated I also think the method is worth while from the standpoint of ascertaining the condition of the duodenum and the sediment in the bile Naturally I look forward to the hope of getting more out of the test from the standpoint of diagnosis than from treatment I think however that it is easy to nurse patients along under this method of treatment beyond the period of its usefulness There seems to me no reason for a patient to come back to the physician again and again for a period of many weeks when he is jaundiced when he has gall stones and when we know he has gall stones in the common duct Of course if you believe that the patient suffers from a mild cholangitis the problem is different but once the diagnosis of gall stones has been definitely made then it seems to me ceaseless pumping of the patient s duodenum is a serious waste of time

Most of my patients are referred with the diagnosis already made and usually with considerable preliminary study but sometimes we have to work on them quite a bit ourselves before operation If no study has been done I like to have the patient admitted at least three days before operation

In addition to the ordinary routine tests such as blood counts urinalysis blood pressure etc we are particular about having the coagulation test blood sugar estimation Van den

Bergh test and usually the plasma CO_2 per cent and tests for renal function All patients who are jaundiced or who have been jaundiced get calcium chlorid intravenously each day that they are in the hospital before operation If the coagulation time is lengthened they also get it Dr Elizabeth Raydin has told you about the van den Bergh test and we do this routinely because we hope that it will tell us whether or not there is an increase in the blood bile pigment before the kidney threshold allows us to find bile in the urine It is important to test the blood sugar because often coincident damage to the pancreas shows as a glycosuria Even if the patient is frankly diabetic we should not discard operation provided she is properly treated beforehand If sugar is present it is highly important to estimate the plasma CO_2 because while we may plan to use local anesthesia and gas yet sometimes we are forced to use ether This anesthetic will depress the liver according to Dr Sweet almost as much as chloroform Finally I should mention that chronic gall bladder disease and especially common duct stone is apt to be a contributory factor in the production of myocarditis Something about the heart condition should be known and preliminary treatment with digitalis is often advisable

Now as to the operation itself I build these patients up so as to throw the intestines downward away from the liver and prefer a round air pillow to a series of pillows because when the operation is finished it is easier to suture the wound with the patient in the flat position and it is easier to let the air out of a pillow than to take out pillows For three years I have been using the transverse incision and in so far as I know have never had a hernia except in a few patients in whom the fascia broke down as the result of suppuration We think it gives us easier and better exposure of the cystic and common ducts and avoids the use of pads against the small intestines If you will look at your text book of anatomy you will notice that only one of the nerves to the rectus is divided I simply cut across the rectus and oblique muscles making as large an incision as I desire without any special efforts to whip over or catch the

edges of the rectus as has been advised Later when we suture the wound vertical mattress sutures are used in the rectus muscle and sheath It is highly important to suture the oblique muscles in their normal positions the external oblique frequently receding high up under the skin

Having made the incision I push the colon and transverse mesocolon down with a pad push the stomach over with another and use a third over the duodenum With the hand and with Deaver retractors always pressing on pads never on the duodenum the fossa can be exposed If it is seen that the gall bladder is diseased and will be removed it is grasped by Kelly hemostatic forceps and pulled upward so as to make the duct taut I never rotate the liver except in those cases of hepaptosis where the liver actually falls out of the wound The cystic duct is exposed and by means of small forceps similar to those used by Lower and by Judd I grasp the cystic duct and artery sometimes separately and sometimes together and divide between We leave a short stump to the cystic duct because I am fearful of injury to the common duct I do not believe that dilatation of the stump of the cystic duct is apt to occur, and at any rate I am not nearly so afraid of its occurrence as a stricture of the common duct It is essential however not to leave too long a stump otherwise some sand or small stones may remain and later find their way into the common duct I drain practically every case and believe that the risk of leakage or other trouble from the stump is too great to allow us to close the abdomen tightly except in the very exceptional case

Dr Riesman said that in the beginning of acute gall stone attacks the patient usually has jaundice This seems to me an important point I often get a history of jaundice from a patient who had an acute attack many years previously but who now suffers from chronic symptoms without jaundice There is thus the possibility of stone in the common duct For the purposes of a paper to be read next Wednesday I have analyzed the gall bladder cases on my service from September 1922 to May, 1925 Thirty two patients stated that they had had jaundice at one time or another, and of these only 19 had stones in the common

duct When, therefore, shall we open the common duct in the absence of jaundice at the time of operation? Perhaps the old rules of Kehr are good ones (1) If there are many small calculi in the gall bladder, and especially in the cystic duct, (2) if chronic pancreatitis is present, (3) if the common duct is thick walled and dilated I might also call your attention to the statement of Eisendrath who found calculi eleven times on opening the duct out of 34 cases palpated and thought negative I need hardly caution you to be careful in the handling of the common duct Many years ago Ransohoff showed that a marked fall in blood-pressure accompanied compression of the portal vein when the finger was passed into the foramen of Winslow and the structures in the gastrohepatic omentum lifted up as is so often done in the technic of exposure and removal of the common duct stone When the common duct has been opened and a stone extracted or probed for, I drain it with a T-tube if there is evidence of infection or jaundice present prior to operation Sometimes we have extracted the stone and allowed the common duct to act as its own drainage-tube

The most difficult problem with which I am forced to deal is that of the very sick patient with jaundice and depressed liver function They need to be carefully studied treated by forcing the intake of water in all of the usual ways, and operated upon under local anesthesia or this combined with ethylene gas and but little done at the primary operation If the cystic duct seems patulous and there is bile in the gall bladder a cholecystostomy is best, if the cystic duct is occluded the gall bladder should be drained and the common duct tapped behind the stone Nothing else should be done except drainage Some weeks later it may be possible to go in again and remove the gall bladder or extract the stone in the common duct We are hoping that by thus dividing the operations into stages as in goiter, we may be able to make the same showing in decreasing the mortality

There has been some argument recently as to the relative advantages of cholecystectomy and cholecystostomy In a consecutive group of 76 cases of simple gall-bladder disease, with

or without stones I drained the gall bladder only 5 times (6 5 per cent) and think that this represents my average In a group of 24 cases of acute gall bladder and duct disease I did a cholecystostomy 5 times One must individualize each patient, but as a rule, the only advantage I see in cholecystostomy is that it gives you another operation on the patient and I am not sure that this is not a disadvantage

Postoperative care requires the utmost vigilance We have more complications after gall bladder operations than after any others and particularly more postoperative pulmonary complications We sit the patients up and give them tap water by enteroclysis routinely If they are sick or if we want to add chlorids, we give salt solution by hypodermoclysis after the Bartlett technic Crile says that morphin depresses the liver function and so we only give it to those patients who must be kept quiet We use large hot packs over the liver and hope to follow Crile in using diathermy We watch for glycosuria or an increase in blood sugar and use insulin or glucose or both when required We have a good deal of trouble from vomiting and frequently practice lavage but as soon as they are able to, we push water by mouth There is not much else to add except that tubes draining bile are not removed until the bile is clear and thin and looks like maple syrup We then test it for pus and for streptococci We have a van den Bergh test made, and if this is above 1 0 unit, we do not remove the tube Common duct fistulæ usually close in a few days if there is no obstruction in the head of the pancreas or stone left behind Gall bladder fistulæ often remain open a long time, and even when bile has ceased to flow a mucous fistula may persist I have had little trouble from this, however, because I do not often do cholecystostomy

RÉSUMÉ OF CASES OPERATED UPON DURING THE CLINIC

Case I Harelip (Operation by Dr Muller) —Male, age four weeks The child has been in the bospital for one week, during which time it was accustomed to a milk formula and was given

orange juice and cod liver oil He has gained in weight and now weighs 11 pounds There is a bad harelip a cleft alveolus and a wide cleft of the palate The child is given ether anesthesia

Today I intend to repair the lip and alveolus leaving the palate for a later operation to be done about one year hence

I will first divide with a thin chisel the buccal side of the alveolar process a little posterior to the region of the canine tooth It is not always necessary to do this in babies younger than this one By digital pressure we try to force the cleft together but are having considerable difficulty and find that they barely meet I am afraid it will not be very successful

I will proceed immediately with the repair of the lip which I almost invariably do by the method described by Thompson of Galveston first we separate the lip on both sides from the alveolus almost as high as the infra orbital foramen and up to but not into the septum this allows complete mobilization Allis forceps are applied to the cheek so as to grip it and effect hemostasis Note how easily the cleft comes together We will now determine what is to be the width of the upper lip and use the opposite side as a standard The legs of calipers are set at this distance One point is fixed at the midpoint of the floor of the nostril and the inferior point of the calipers rotated describing an arc which crosses the lip on each side of the cleft At the vermilion border the point is pushed into the flesh to make a mark The incisions are now carried from the point of the nostril to this point on the vermilion border in a straight line the scalpel cutting through the entire thickness of the lip We will do this on the other side You will now note that when I bring the two cut surfaces together they give me a line for suture which is exactly the length of the breadth of lip desired The vermilion border is pointed and left long so as to make a downward tent or projection which later takes up for shrinkage of the scar and lessens deformity I find the triangular shaped Bard Parker knives work well for this incision We will now sew up the lip by non absorbable sutures and at present I am using a substance known as equisitine The upper suture is placed well within the nostril Four additional sutures are

passed as you see, through the full thickness of lip except the mucous membrane At least one of these, and sometimes two, are threaded on fine rubber tubing and reintroduced so as to make a vertical mattress suture The sutures are now carried around the vermilion border and up the mucous membrane in the mouth, almost to the alveolus

The after care of this child is of the greatest importance, no dressing is applied to the lip but several times a day the nurse must sponge the suture line with pledgets saturated with boric acid solution so as to remove crusts Severe crusting leads to nasty scarring around the stitch holes The sutures may be removed in from eight to ten days and the baby allowed to go home

QUESTION How about feeding the baby?

ANSWER We will feed him with a dropper for about five days and then use the bottle

QUESTION What method do you use in closing the hard palate?

ANSWER When the child is at least nine months old and weighs more than 15 pounds we will begin to plan to operate, and at the present time I am effecting the repair of the hard palate alone, at a first stage This is done by the old method of Langenbeck or in the case of wide clefts I am trying the method of New in which there is a preliminary raising of the flaps with subsequent shifting five or six days later After the hard palate has been completely closed by one two or more operations we will repair the soft palate This stage is postponed because if we should fail to effect union the soft palate through scarring would become rigid and the end result very poor as concerns good speech After all is done the child is referred to someone for speech training

Case II Chronic Gall-bladder Disease—Strawberry Gall-bladder (Operation by Dr Muller) —The next patient is fifty years of age He had typhoid fever in 1903, influenza in 1916 In other words he has had the three infections that may predispose to gall bladder infection His present symptoms began

two years ago with attacks of pain on the right side often at night, and lasting several hours Sometimes he vomited There have been at least six attacks He has never been jaundiced He is easily susceptible to dietary disturbances and cannot eat fatty food The last attack began three weeks previously, at 2 A M in the morning and was characterized by terrible pain over the gall bladder with vomiting He got relief from his physician Dr Dever of Bethlehem and at 10 A M was completely relieved

Up to this point we believe that the patient is suffering from gall bladder disease with gall stones and that the attacks are due to the impaction of the stones in the neck or in the cystic duct Naturally, they do not remain permanently in the cystic duct or he would have more or less hydrops or possibly an empyema

Deep palpation over the gall bladder gave a certain amount of tenderness The *x* ray showed a duodenal defect due to extrinsic causes We attach a good deal of importance to this finding and believe that one is more apt to have adhesions arising from a gall bladder lesion than from a duodenal ulcer The acid in the gastric secretion is about normal and as you know it is usually this way or even subnormal in gall bladder disease in contradistinction to ulcer when it is usually high The van den Bergh test gave a negative direct reading and an indirect reading of 0 2 unit This is low normal and shows that there is no jaundice and no damage to the liver cells The bleeding time is two minutes the coagulation time two minutes

The patient is under nitrous oxid oxygen anesthesia and we will also infiltrate the intercostal nerves by a field block with novocain You will notice that we are painting the skin with a mixture of mercurochrome (1 per cent) and McDonald's solution in the proportion of 1 to 4 I used iodin until 1922 and then for three years used picric acid We had trouble from the former owing to an occasional burn and in five instances picric acid gave a troublesome dermatitis So far we have had no trouble from the mercurochrome acetone mixture We are making a transverse incision it gives better exposure less ens the

amount of handling and packing of the small bowel, enables one to close with the minimum risk of hernia, and we think that the patient has less postoperative pain Naturally, we occasionally get a hernia but in such cases the wound has broken down from suppuration I have exposed the gall bladder, and you will note that it is only moderately distended, I find that it contains at least two stones, there are only a few pericholecystic adhesions and the stomach and duodenum are negative I grasp the gall bladder with Kelly hemostats, and by pulling on these I am able to make the cystic duct taut, more easily expose it, and ligate I am now cutting between the hemostats on the cystic duct and will tie the vessel separately I am using a linen suture to tie the cystic duct because we intend to close the wound without drainage We next work the gall bladder off the liver partly with scissors and partly by sponge dissection, endeavoring to avoid the slightest tear in the liver substance As you see the liver bed is dry, and I will not oversew it Everything is now dry and ready for closing, but first I will examine the appendix Here it is, normal in appearance, not kinked in any way, we will leave it alone The air in the cushion will be released and when the patient flattens out it is easy to close the wound You will notice I am taking special precautions to bring together the exact cut surfaces of the oblique muscles We are closing the skin with interrupted vertical mattress sutures of silkworm gut and a few intervening skin stitches of equisitine The entire operation time has been thirty five minutes and the patient is in perfect condition He should make *an uninterrupted recovery*

Note—Patient did not make an uninterrupted recovery, following operation he suffered from acute dilatation of the stomach and hiccup and vomited for a number of days We could find no reason to account for this all of the blood chemistry studies being normal Constant lavage of the stomach was the only thing that helped out On November 3d his wound ruptured and it was resutured immediately somewhat after the method described by Shipley in a recent number of the Annals of Surgery After this he made *an uninterrupted recovery* In

a letter to his physician on November 27th it was suggested that he be put on a low fat diet for at least six months and should wear a belt In spite of his complications the wound felt quite tight Examination of the gall bladder revealed a typical strawberry gall bladder

Case III Duodenal Ulcer (Operation by Dr Muller) — Male, age forty six, for two years has had discomfort and pain in the upper abdomen usually coming on three and a half hours after eating The symptoms have been getting more severe until three weeks before admission when he had pain after every meal and frequently forced himself to vomit in the hope of getting relief He feels hungry but is afraid to eat and has lost 50 pounds in three months Thirteen weeks ago an x ray made elsewhere was said to have been negative He was admitted to the Medical Service in a condition of dehydration, suffering from pyloric stenosis and in a few days was transferred to us for operation

The gastric contents show a marked hyperacidity, the plasma CO_2 is 72 vols per cent and the hemoglobin of the blood is 61 per cent Since he has been on our service about twenty four hours we have succeeded in introducing 6000 c c of salt solution by hypodermoclysis We are operating under nitrous oxid and oxygen anesthesia reinforced by novocain field block We make the usual right rectus incision and pack off the bowel Here in the first portion of the duodenum is a large indurated ulcer and the well known stippling sign is apparent There are marked periduodenal adhesions and the inflammatory reaction has invaded the pancreas The duodenum is bound down so tightly as to make it fixed What shall we do? We can burn out the ulcer with a cautery but I doubt whether we would find sufficient decent tissue to hold the bite of the needle and leakage might ensue We can do a pylorectomy or a partial gastrectomy, and I would much prefer to do this but it seems too risky in this case We will drop the ulcer area back into the abdomen and perform a posterior gastro enterostomy We will perform this in the u ual way using iodin catgut No 0 throughout,

and, as you see using the Eastman gastro enterostomy clamp I find it very advantageous to use the aspirator with the Pool aspirating tip working in the cut stomach and jejunum I plan to wait about four months after this operation and then have the patient return for x ray and clinical studies If all is not well we can reopen the abdomen and do a Bilroth II gastrectomy I might have done a Devine operation but think it would be best to remove the ulcer bearing area at a later operation We are now finished with the gastro enterostomy but notice a little oozing near one of the sutures Never close the patient until the area of the gastro enterostomy is perfectly dry because ooze adds to the chance of adhesion formation and these often produce distortions of the stoma with resulting so called vicious circle

Note—This patient made an uninterrupted recovery and was discharged on November 14th He was given a diet sheet which has been adapted from others on record and it may interest you to read just what we tell these patients on discharge

POSTOPERATIVE DIET FOR GASTRIC AND DUODENAL ULCER

For Three Months—Milk cream toast frozen butter balls potato soup cereals mashed or baked potatoes rice jelly junket well ground beef chicken squab soft puddings and boiled eggs

Eat small meals but about six a day taking milk and cream equal parts with crackers between meals

No salads fresh fruits fried food rich food condiments or spices and above all do not overload stomach

During Fourth Month—You may gradually assume normal diet Bread a day old may be substituted for toast A small portion of tender well cooked lamb or fish (fresh water perch bass or pike very fresh) also stewed apples cherries peaches berries as well as cooked asparagus tips peas string beans ice cream etc may be slowly added

For Six Months—The food must be run through a food chopper and a very good one is made by the Enterprise Manufacturing Co of Philadelphia, and is on sale at most hardware stores This device with its three wheels will grind any kind of food Your stomach requires care during the rest of your life and you must live your life in a hygienic manner keep your bowels regular restrict your working hours if possible exercise moderately eat slowly chew your food have your teeth attended to by a good dentist at least every six months smoke moderately if at all abstain from alcoholic drinks and avoid fatigue Take for six months 10 grains of sodium bicarbonate and 10 grains of calcined magnesia four times daily

Case IV Omental Adhesions (Operation by Dr Muller) — Girl, age fourteen, in April 1924 she was operated on for appendicitis at another hospital, since then she has had pain in the right lower quadrant which has not been relieved by any treatment and is getting worse During the last attack—four days ago—she had vomiting There is nothing to tell you about her except this history because all laboratory examinations are negative or normal and as you see she is a strong stout girl I always operate on these patients because so often we find that the omentum is plastered against the peritoneum of the old wound, and by dragging upon the colon will produce all sorts of symptoms Sometimes such adhesions simulate gastric ulcer or gall bladder disease Many times I have found great tenderness immediately over the scar and have come to believe this is pathognomonic of adhesions to the anterior wall

We will now cut out the old scar and open the abdomen Just as we expected the omentum is adherent but unexpectedly I find a loop of ileum caught under the omentum and almost amounting to an incarceration This explains the vomiting Dr Ravdin will sew the patient up in the usual manner

Note—Patient made an uninterrupted recovery and was discharged November 8 1925

Case V Pyonephrosis and Nephrolithiasis (Operation by Drs Muller and Ravdin)—Woman, age twenty six, first seized with the symptoms of renal colic in October 1924 In April, 1925 she had a second attack, and was admitted to this hospital at which time a stone in the pelvis of the kidney was diagnosed Surgical intervention was refused The third attack occurred in July and the fourth in September The final attack began on October 18th with severe pain vomiting and chills. On admission to the hospital she was found to have a mass in the left flank and rigidity of the flank muscles The leukocytes were 32 000 *x* Ray showed a calculus in the left pelvis Cystoscopy showed a normal right kidney function but no urine whatever issuing from the left ureter

We are using gas anesthesia and will make the usual oblique

loin incision The perirenal tissues are markedly edematous but the kidney is easily exposed although the capsule could not be separated from the surrounding fat Accordingly we will incise the capsule and do a subcapsular nephrectomy It is very thick and I can easily shell the kidney and we have hopes that this can be done without rupture This is quite a trick and often works although it is necessary to leave quite a bit of the pelvis in the wound Unfortunately I have just done the unexpected and have entered one of the thin walled pockets of pus and you see it discharging green and thick We will get as much out of it as possible with the aspirator and go on with the nephrectomy I have never much trouble with these pedicles because the vessels are usually so buried in exudate that bleeding is easily handled Still one must be careful We now have the kidney out and will put in some iodoform packing and a drainage tube

Note—Patient made an uninterrupted recovery and was discharged on November 11 1925

Pathologic examination of the specimen showed the mass to be a pyonephrosis with multiple abscesses A stone the size of a hazelnut was found in the pelvis

Case VI Subacute Appendicitis (Operation by Dr Ravdin) —Woman age twenty five in this case we have delayed treatment for forty eight hours not because we were not certain of the diagnosis but because there have been unfortunate circumstances connected with the case Ten days ago this patient's niece was admitted to the hospital in the late stages of peritonitis two days later this patient's brother developed an acute perforated appendix and then this patient came in with an acute appendicitis Her leukocyte has not gone down during the forty eight hours which we have waited and so we have decided not to wait any longer

Whenever we make a diagnosis of acute appendicitis we use a McBurney incision We have never been satisfied with the right rectus incision as it exposes the area of the small bowel and then too we believe that you are closer to the cecum through

a McBurney incision We always lift the cecum up and then locate the appendix before we do anything else This patient had appendical colic and her leukocyte count was not high She bas not been given castor oil She has an adhesion against the posterior wall

Note—Patient made an uninterrupted recovery except for a mild infection of the subcutaneous tissues One stitch was removed and after forty eight hours of treatment with wet dressings the infection cleared up

Case VII Pilonidal Cyst (Operation by Dr Ravdin)—Woman age twenty four, five years ago a small abscess developed in the midline of the lower sacral region It was opened and packed She has bad trouble off and on for some time with discharge, and comes in with a small fistula about 2 inches from the anus and 1 inch above the tip of the coccyx We have had many of these cases and most of them have been operated upon a number of times by physicians and surgeons under the diagnosis of abscess or rectal fistula The condition is a congenital one and is due to the inclusion of a skin lining in a faulty closure We have adopted the following technic which will be adhered to in this case The sinus is injected with a solution of methylene blue and then an oval incision is made cutting out a narrow strip of skin and the entire block of underlying tissue down to the fascia on the bone This block must include all tissues stained by the blue and which represents the original and branching sinuses The wound is then packed with iodoform gauze and treated by irrigation for about five days at the end of which time it is sutured In a sense this is delayed primary closure Formerly we used to sew up the wound *per primam* but found that many cases suppurated and had to bave prolonged treatment Dr Muller therefore thinks it advisable to divide the operation into two stages The first stage of this operation was done on October 20th and today we will do the closure

Note—Patient was discharged on November 2d apparently healed

Case VIII Carbuncle (Operation by Dr Muller) —Woman age forty eight this large carbuncle has been slowly developing for six days she eats an excess of carbohydrates but the urine is negative for sugar The blood sugar is 0 112 She is under gas oxygen anesthesia and I am going to cut out the carbuncle by a circular incision carbolize the wound cover it with a paraffin mesh and pack iodoform gauze against it At the end of twenty four hours we will commence dressing the wound twice a day and irrigate or lightly scrub with cotton pledgets using peroxid of hydrogen As soon as the wound is cleaned and free from any yellow exudate it will be painted with mercurochrome (2 per cent) for a period of forty eight hours and then skin grafted

I suppose that most of you think that carbuncle is always associated with diabetes but recently I found from an analysis of a consecutive series of 42 cases admitted to this hospital that only 6 patients (14 3 per cent) were diabetic and of these 4 died (66 7 per cent.) There was only 1 death (2 8 per cent) in the non diabetic group Consequently we expect a good result in this case

Note—The patient was discharged on November 1st after signing a release so that the skin grafting was not done Wound looks well and she wishes to return to her family physician for postoperative dressing

CLINIC OF DR BROOKE M ANSPACH

Jefferson Hospital

CASE I ADHERENT PAROVARIAN CYST

The first patient is a woman twenty nine years old married four years, no children Her chief complaint is pain in the left lower abdomen of three years duration but very recently became worse She applied for treatment at the dispensary without being aware of the abdominal enlargement that you may plainly see Her attacks of pain have never been severe enough to call a physician She has no history of attacks of pain with fever but on one occasion she had fever with a 'cold' as her friend and interpreter expressed it

The tumor is symmetric and as we look we think first of pregnancy Chipman of Montreal reminds us that pregnancy is the most common abdominal tumor but this woman has had her periods regularly although since her marriage they have gradually diminished in amount They have never been profuse and she has always had great pain There are no signs of pregnancy there is no bluish discoloration of the external genitalia, and on bimanual examination the cervix is found displaced forward and upward almost immediately back of the symphysis the body of the uterus being pushed far to the right

The tumor is cystic and lies behind and to the left of the uterus, it is fixed but somewhat indefinitely outlined and doughy, as if it were incompletely filled We believe that this is a cystic tumor of the parovarium

The general condition of the patient is satisfactory for operation The phthaline output is good, the blood count shows a moderate degree of anemia nothing more, there is no eleva-

tion of temperature and the heart and lungs are normal I usually make the incision big enough to admit my hand and thoroughly expose the tumor If there is any suggestion of malignancy or infection one would not wish to tap the tumor and afterward the incision may be enlarged sufficiently to deliver it I start to the patient s right of the umbilicus and bare the upper surface of the fascia from the fat as I go because it is easy to do it now and we shall then be ready to slide

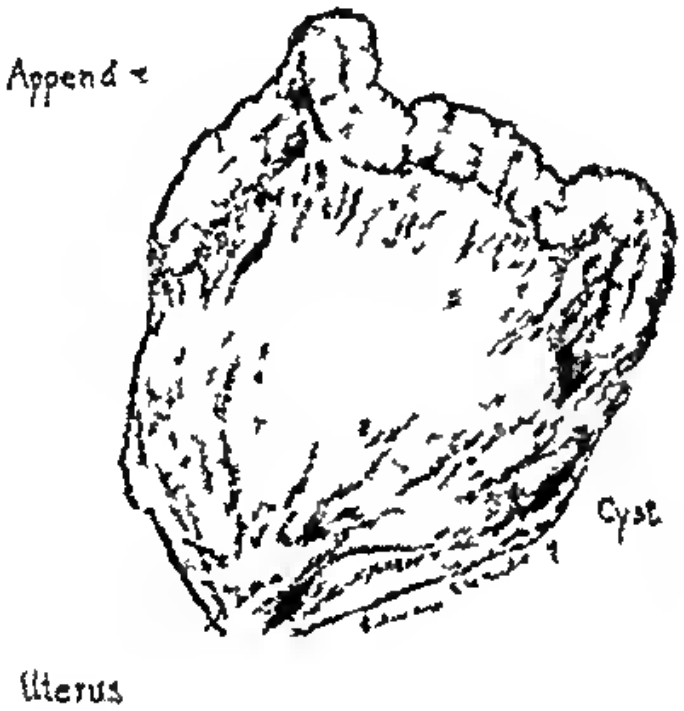


Fig 555 —The appearance of the pelvic and lower abdominal contents upon exposure

the fascia on the left side under the fascia on the right side in closing Instead of going through the rectus muscle I pick up the fascia find the mesial edge of the muscle and pull it over to the right, exposing the peritoneum the muscle will then cover the line of the peritoneal suture when the incision is closed We can see at once that there are many adhesions (Fig 555) We have a woman in the ward now who had an enormous ovarian cyst with extensive adhesions to the anterior abdominal wall and the omentum, the upper pole of the tumor was attached

to the gall-bladder. When the adhesions are light we separate them by pressure, but when they are dense it is often better to cut them. Here they are very dense; the omentum is "plastered" over the tumor in every direction.

I divide the omentum, leaving the lower part attached to the pelvic tumor, so that we are able to expose and view the small intestines, and get them out of the pelvis, as, fortunately, they are not adherent. It is curious how a patient could have had so much peritonitis as is apparent here without giving any history of it. This may be due to the fact that we had to rely on the services of an interpreter.

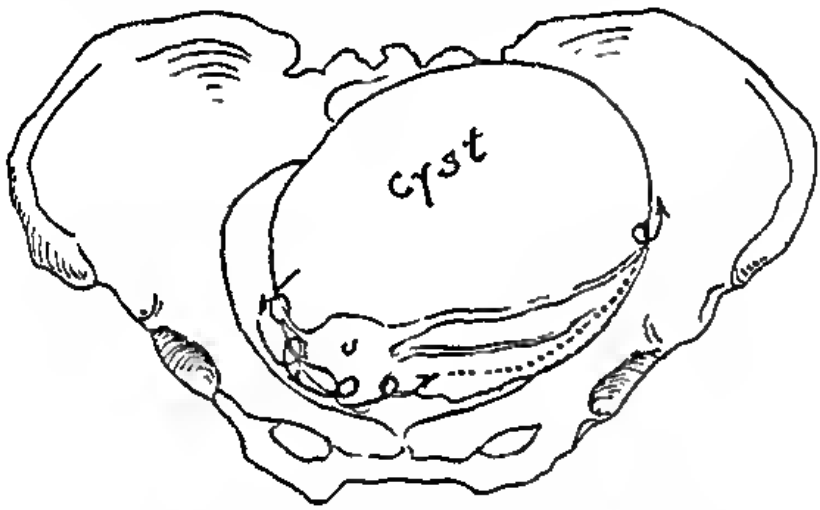


Fig. 556.—The general scheme of operation—hysterectomy from right to left.

The advice has been attributed to Montgomery, that when one is confronted with a conglomorate pelvic mass, "Find ye first the fundus of the uterus, and then the tubes and ovaries will be added unto you."

I will not evacuate the cyst contents until I have done a little more orientation. We can feel here the body of the uterus in front and to the patient's right. The appendix is adherent to the upper pole of the tumor. The adnexa on the patient's right side are densely adherent to the right culdesac; the tumor fills the pelvis, but lies within the left broad ligament; the bladder peritoneum is adherent over the entire front of the uterus; upon dividing the adhesions the uterine body is exposed. I now evacuate the fluid, reducing the size of the tumor, and enabling

me to do a hysterectomy from right to left (Fig 556) exposing and securing the left uterine and ovarian vessels after division of the cervix The contents of the cyst is clear and of low specific gravity there is no blood or pus The sigmoid is so intimately attached to the cyst wall that ligation of the left ovarian vessels and release of the cyst will be facilitated by enucleation from below upwards after dividing the cervix In doing a hysterectomy after the ovarian vessels have been secured to the outer side of the ovary I put a clamp to the uterine side along the body of the uterus the extremity of the clamp extending downward almost to the point elected for division of the cervix There will then be no bleeding from the section of the broad ligament There is one good thing about the uterine artery no matter how much distortion of the parts and displacement of the vessel it may be located by palpation I have now secured the right uterine vessel and am cutting through what I take to be the uterus here is the cervical canal which I am very glad to see if I cut too far I may sever the uterine vessel so I carry the incision just to the edge of the muscle and then with traction and pressure push the tissues away from the sides of the cervix and locate the left uterine artery by palpation both uterine arteries are now tied

I now enucleate the cyst from below here is a secondary and smaller loculus going deep to the very bottom of the pelvis the rectum and sigmoid as you see are extensively adherent I respect the rectum a great deal there have been times when I did not respect it enough and got into trouble The older I grow the more care I take in handling it and so we proceed very slowly here

One must always keep in mind constantly the possibility of injuring the ureter you avoid injury by systematically palpating *and identifying every structure in the path of the enucleation* before dividing The attachment to the sigmoid is so dense that I am forced to cut it We are now tying off the ovarian vessels I will ask Dr Richards to take the specimen and open the uterus to make sure there is nothing malignant inside Ordinarily before doing a hysterectomy for myoma

of the uterus, I dilate the cervix and curet as a preliminary measure This at once reveals a complicating carcinoma of the cervix or endometrium, so that one may immediately proceed to do a pan hysterectomy It is better to make sure of this before opening the abdomen, if one finds a cancer only after the amputated uterus is opened, it is a considerable disadvantage then to be obliged to remove the cervix

I like to ligate both uterine and both ovarian arteries with two separate catgut ligatures A bridge builder always takes account of unexpected strain Secondary hemorrhage has followed single ligation with catgut in many instances

There is a good deal of bleeding from the raw surfaces I look for special points of hemorrhage and put in a few mattress sutures, this one is close to the left ureter, so I am careful to hold the ureter to one side

Of course anything like the usual peritonealization is impossible here, but we will at least cover the uterine stump by pulling the bladder peritoneum over and suturing it to the posterior surface of the cervix I put a rubber drainage tube to the bottom of the pelvis and close the incision in such a way that the tube may be taken out at the end of twenty four hours, and the last through and through silkworm gut suture tied at that time Such a plan permits the oozing blood to escape, but it interferes in no way with the convalescence and healing by first intention

Dr Scheffey has just reminded me of the appendix, the tip of the appendix was attached to the cyst The simplest way of removing the appendix is to ligate the meso appendix with catgut, surround the base with a circular suture of linen, ligate with plain catgut, and divide with a cautery knife The closure of the incision I have always regarded as a very important part of the operation One of the most important steps is to evert the peritoneum, another is to overlap the fascia

Dr Ginsberg will now entertain you with a demonstration of the direct method of cystoscopy While there are cases in which the water cystoscope is more convenient for the patient, the direct method is the better one, although it is much more

difficult to learn Dr Ginsberg has made a sincere effort in our work here to differentiate the pain due to disturbances of the ureter and the kidney from those due to pelvic disturbances

DR GINSBERG

In making examinations for narrowing or stricture of the ureter we employ the direct method of cystoscopy, that is a modified Kelly cystoscope with the patient in the knee chest posture A small wax bulb is placed upon a No 7 catheter and the catheter is passed up the ureter, upon withdrawal of the catheter, if there is a definite 'hang' of the bulb we assume there must be some narrowing of the ureter Of course, the diagnosis of stricture depends upon what one considers the normal caliber of the ureter The average cystoscopist is satisfied that no obstruction exists if he is able to pass a No 7 catheter up to the kidney

If you examine this metal plate which has a graduated French scale on it you will notice how small No 7 is and you will be more ready to agree with me that the caliber of a normal ureter is greater From many examinations of symptom free patients and ureters removed at autopsies we feel that you ought to be able to pass a No 9 F catheter or a catheter with a $3\frac{1}{3}$ mm wax bulb which is equivalent to a No 9 catheter, up the ureter and withdraw it without a definite hang provided the ureter is normal

You will notice in this pyelogram that the ureter and the kidney pelvis appear normal yet this patient had a marked narrowing or stricture of the right ureter, just why there is no dilatation in some of these cases we are unable to explain positively, but it probably is because the case is recent, the majority of patients with symptoms of some duration have a dilated ureter and pelvis above the obstruction

*The second plate shows a very marked scoliosis of the ver*tebræ The right kidney was movable and the ureter has taken the shape of the letter S, while the left kidney is almost down in the pelvis and the ureter makes nearly a complete circle It is of interest to note that there is practically no dilatation of

either ureter This patient had no pain or urinary symptoms and only came into the hospital because she required an operation for hernia

The third case shows a much dilated kidney pelvis with a narrowing or stricture at the ureteropelvic junction The kidney is up in good position This is the type of case that may be mistaken for gall bladder disease if it is on the right side as the pain often radiates anteriorly along the costal region

The fourth pyelogram is that of a patient with a movable kidney with a large dilated ureter and kidney pelvis the obstruction of the ureter being just above the bladder As her pain was high up in the lumbar region and the ureter was also kinked just below the kidney we felt that her symptoms were produced by the ptosed kidney After thoroughly dilating the stricture in the ureter with large wax bulbs without relief of pain the kidney was suspended in normal position The patient was cured

QUESTION What solution do you use?

ANSWER For our pyelograms we use 15 to 20 per cent sodium iodid On the first 2 cases shown we used 25 per cent but in the past year we have been using a weaker solution

QUESTION Did you get by that point with your catheter?

ANSWER No In the second case the catheter completely obstructed about 3 inches above the bladder due to the peculiar twisting of the ureter In this case the solution had to be injected up the ureter If possible it is safer to use the gravity method when making a pyelogram

QUESTION Do you leave the stilet in the catheter?

ANSWER Ordinarily the stilet is withdrawn after the catheter enters the ureter but if there is a marked narrowing it is better to leave the stilet in the catheter until you pass through the obstructed area If there is a stone in the ureter you may detect it by finding scratch marks on the wax bulb

QUESTION What kind of spoon and wax do you use?

ANSWER We use an especially made spoon a tiny bowl with a long handle but a gall bladder spoon is just as good The bulb is made with ordinary melted beeswax

QUESTION What is the outlook following dilatation of the ureter?

ANSWER We find it very good, the majority are often relieved of their pain after two or three dilatations, occasionally you come across a patient that seems to resist all methods of treatment The patients also receive kidney lavage with weak solutions of silver nitrate (1 1000 or 1 500)

CASE II TUBAL ABORTION: PELVIC HEMATOCELE

DR ANSPACH

The second patient is twenty five years old and has been married seven years She is a frail little woman, with a history of regular periods, though always somewhat painful She has no history of leukorrhea or "cold in the bladder," or any other symptoms usually inquired after in searching for a history of Neisserian infection Her last normal period was on September 5th, three weeks ago, on October 3d when the menstrual period was due, she had just a "show" of bleeding, the flow did not come on normally during that night she was awakened by a pain so severe that she fainted She then from time to time, had a little bloody discharge until two or three days ago, when she had a repetition of the severe pain and an increase in the bleed ing You know what this history suggested to us immediately, in fact, she was sent in by her family doctor with a diagnosis of extra uterine pregnancy

On pelvic examination yesterday the uterus was displaced forward and to the left, a little increased in size, to the right side there was a cystic enlargement the size of an orange, which was exquisitely tender We had to differentiate between a ruptured ectopic with pelvic hematocele and a threatened abortion with pelvic abscess In the diagnosis of extra uterine pregnancy we rely very much upon the history, and in a freshly ruptured case especially we tell the students that they must not depend as much upon the pelvic examination as upon the history and the clinical findings, particularly the blood count and the blood pressure When this patient came in yesterday she had some

fever, with a pulse of 100 Her blood pressure was 100/80 Her blood count showed 58 per cent hemoglobin 3 000 000 reds and no elevation of leukocytes During the afternoon the blood pressure fell just a little but the blood count late in the afternoon showed no variation of any consequence in the hemoglobin the white cell count a little lower while the red cells remained about the same This morning the temperature is normal I can verify the position of the uterus in front and back of it a mass that is distinctly fluctuating I propose to make a posterior vaginal incision confirm the diagnosis of hematocele, put in a rubber drain and then proceed with the abdominal operation In acutely ruptured cases of course we open the abdomen as soon as the diagnosis is made For a while in the past I was somewhat influenced by the teachings of the advocates of a waiting policy with the idea that the woman should not be exposed to an operation *in extremis*, and that with rest and without stimulation the blood would clot and the general condition become more favorable

The advocates of a waiting policy have not been sustained by experience, but their teaching had several important elements of truth—one was to avoid repeated pelvic examinations, another was to withhold any stimulation, and a third was to relieve pain and promote quiet by the administration of morphin

Following the initiative of Dr Klopp of this hospital in the desperate cases we do blood transfusion during the operation, using the blood in the abdominal cavity

The symptoms here have not been altogether typical She appears to have lost more blood by the vagina than usual and the pelvic mass seems unusually well defined the white cell count either with an abscess or a hematocele should be increased but it is normal There have been a good many scientific explanations of spotting seen in ectopic pregnancy, but I have been pleased to fix it in the minds of students by telling them that the spotting is the evidence of the disappointment of the decidua in the non appearance of the ovum The "reception committee' becomes useless and the uterus tries to expel the foreign body

In a freshly ruptured case where the anemia is extreme we put a cannula into a vein before making the abdominal incision, and are ready to proceed with the intravenous as soon as the bleeding vessels are secured I remember an acute and fatal case, in which, partly from necessity, the waiting policy was

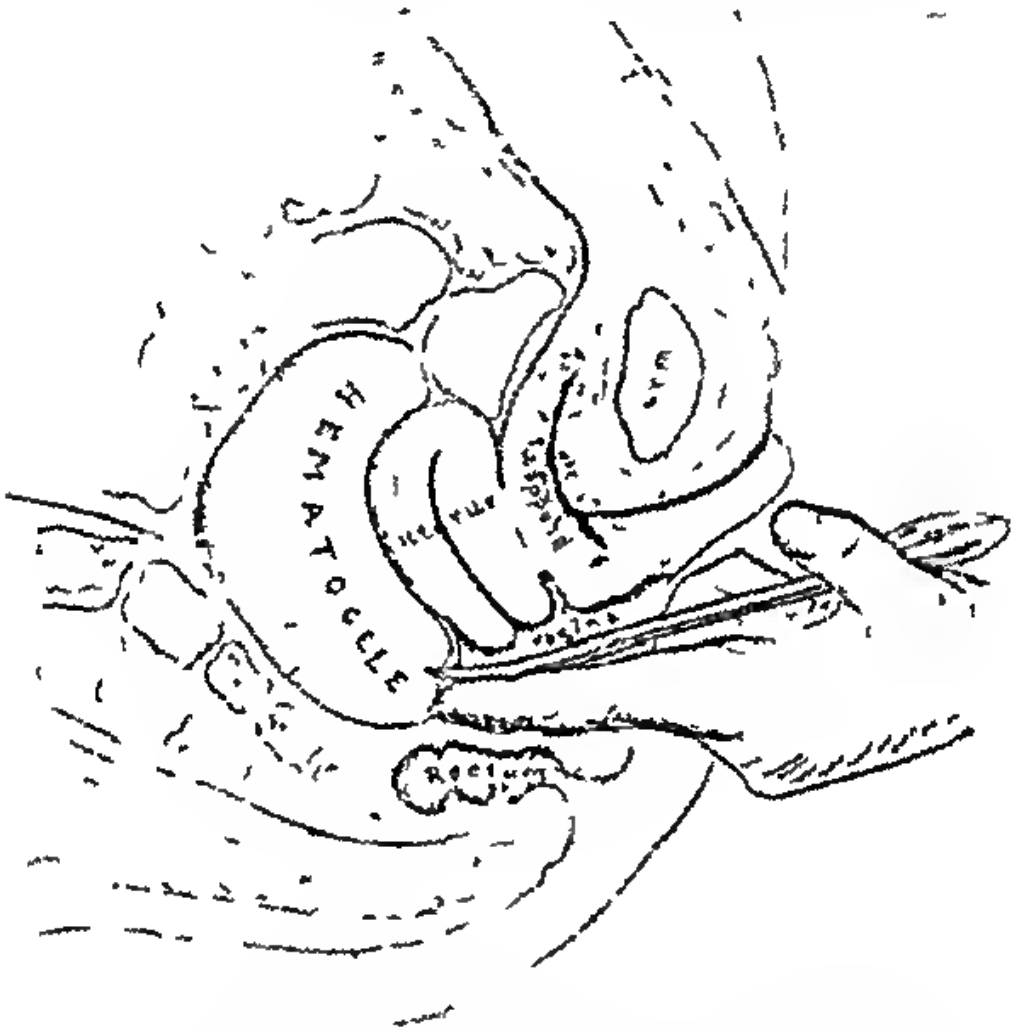


Fig 557 —The transverse incision through the vaginal mucosa has been made, the finger palpates the lower pole of the cystic mass as the point of the scissors is thrust into it

adopted, the woman got up in the morning perfectly well, she was a little over her period and thought possibly she was pregnant, she was stricken soon after breakfast with a sudden violent pain There was a little trouble in getting the doctor, who thought she had indigestion, but on being called a second time decided it was a ruptured tubal pregnancy. I saw the patient

at 1 o'clock The husband was so surprised and shocked with the news that his wife was seriously ill, and being rather new in the neighborhood, and not knowing either of us insisted upon having his old family doctor in spite of our warnings and pleadings to take her to the hospital without delay The doctor finally arrived and told the husband to go ahead immediately with our suggestion It was 4 o'clock before she reached the hospital She was by this time *in extremis* We waited for reaction but it never came and the patient died I would never again adopt such a policy

One of the striking characteristics of a pregnant tube is its exquisite tenderness, palpation of the pelvic mass in this patient gave her great pain I catch the posterior lip of the cervix, put the posterior vaginal wall on tension and make a transverse incision through the mucosa, with my forefingers I locate the lower pole of the cystic mass and thrust the scissors into it (Fig 557) You see the dark chocolate colored contents coming out, it is a pelvic hematocele We will use a rubber drainage-tube, fixing it to the posterior vaginal incision with a catgut suture

Before preparing the abdomen we introduce a rectal tube in order to facilitate enteroclysis at the close of the operation We do not have enough nurses to give enteroclysis to each patient in the ward and so like Clark we use a quart of solution while the patient is on the table, this is usually sufficient and subsequent enteroclysis is unnecessary The introduction of a solution is also of value when an injury to the rectum is suspected, a perforation is not always easy to find by simple inspection and if one is overlooked there is not much hope for the patient.

This was probably a tubal abortion one of the two terminations of a tubal pregnancy The pregnant ovum either gets into the center of the tube and then the tube expels it (tubal abortion), or the chorion villi eat their way through the wall of the tube and it ruptures (tubal rupture) The amount of bleeding depends on whether it is an abortion or a rupture In abortion the hemorrhage is more likely to be limited and a pelvic hematocele is more likely to form I well remember a woman who got up perfectly well on a Sunday morning walked to church and back,

and ate a heavy dinner of pork and cabbage Very soon afterward she had an attack of violent pain which very much resembled an acute gastric upset but because she had missed a period and the tenderness was greatest in the lower abdomen and there was marked pallor a diagnosis of tubal abortion was made and operation advised A considerable quantity of free blood was found in the abdomen the entire mole had been expelled from the tube and lay in Douglas pouch and the bleeding had entirely subsided The bleeding in rupture is sometimes very sudden and excessive I have seen 2 cases of rupture of the interstitial part of the tube the blood pouring out of a hole that looked as if it had been made with a punch In the first case of this kind as soon as I had made an incision I passed my hand into the pelvis thinking to clamp the affected side but the tubes felt normal it was only after exposing the pelvic organs that I found the opening in the uterine cornua the enlargement was so negligible that it was not detectable by palpation

You see the bluish discoloration of the peritoneum there is a little free blood in the peritoneal cavity the omentum is plastered down over the pelvic mass the uterus is in front. Here are the blood clots here the mole and here the pregnant tube

QUESTION Did you take the ovary out with the tube?

ANSWER Yes I did because it was much involved and especially as the opposite ovary was normal

QUESTION Are you in direct contact with the rubber drainage-tube put through the vagina?

ANSWER Yes it is right here at the bottom of the pelvis I can show it to you

QUESTION Do you always do the exploratory vaginal incision in these cases?

ANSWER Very rarely because as a rule we operate on these cases *before* or at the time of rupture and the diagnosis is quite plain and drainage is unnecessary I did it in this instance because I expected to find an old collection of blood that required drainage it was also possible that this was an abscess complicating an abortion in which event drainage would have been all that was necessary We have quite a large number of extra

uterines here; I presume 5 or 6 in a season that come in acutely sick. This is the second in a week, the first heing a woman who was hrought in on the surgical side with a diagnosis of appendicitis; hut her symptoms suggested pelvic disorder, and Dr. Stimson, who saw her, suspected an ectopic; while under observation in the gynecologic ward she suddenly ruptured and was operated on during the night by my colleague, Dr. Righter, who happened to be in the house.

I have removed the tuhe in this patient with a V-shaped excision, so that there will be no chance for another ectopic on the same side, in the interstitial part of the tube; it is not uncommon for a pregnancy to develop in the stump when the tube is simply ligated and dropped. We are convinced of the great value of hlood transfusion, and we have the good fortune to be associated with an expert in the use of the Unger method, Dr. Harold Jones. Transfusion is used in patients with uterine myomata associated with marked anemia requiring operation and unsuitable for treatment with radiation. We also use it in inflammatory cases with persistent temperature, and without localization or pus formation. Transfusion will usually increase the resistance of the individual, so that localization or suhsidence of the infection takes place, it not only improves the hlood-supply but also acts as a foreign protein. If the patients are not especially anemic, we give them intramuscular injections of hoiled milk. There is a patient in the ward now who had a persistently high temperature for several weeks, but following the use of milk injections the patient has improved generally and the temperature has gone down to normal In dressing the incision we dispose of the straps as you see them, and use only a thin layer of gauze, so that the dressing closely fits the abdominal wall and permits the effectual use of cold or heat.

Dr. Frank F. Simpson, of Pittsburgh, who was a very careful observer of postoperative symptoms, and Charles P. Noble, for many years at the Kensington Hospital for Women, used cold for the relief of pain, and as a prophylactic against postoperative peritonitis. We use ice as a routine. If the patient prefers at the end of forty-eight hours we change to heat. We

have also been in the habit of using heroin to relieve the distress of the patient The hardest thing for a patient to do after an operation is to lie on the back more or less continuously The muscles are tired and it is a great trial Heroin relieves this distress and enables the patient to lie without much turning and twisting If there is much discomfort in the first twenty four hours we give the heroin every three or four hours gradually increasing the intervals until by the end of the second day it is needed only at night after that in order to promote sleep allonal is effectual

CASE III RADIUM TREATMENT OF CANCER OF THE CERVIX

The next patient will serve to demonstrate the radium treatment of cancer of the cervix The thing to do with cancer of the body of the uterus is to remove the uterus You have a good prospect as long as the disease remains within the uterine wall and it does remain there for a long time for it is of comparatively slow growth With a tolerably early diagnosis you get a large percentage of cures Most of the cases get well and stay well but while cancer of the body of the uterus is easy to handle cancer of the cervix is hard It is a different problem the radical operation is difficult and the cure is rare The principal trouble in the treatment of cancer of the cervix seems to be recognition of it at a stage early enough to make an operation successful Then in the performance of the operation there are so many technical difficulties that it is often not very well done A man like Wertheim who had charge of the Gynecological Service in the General Hospital in Vienna which would be comparable to one man in Philadelphia having charge of all the cancer cases in the city had so large an operative experience that he could perfect his technic to a far greater extent than the man who operates on a case occasionally Wertheim as a matter of fact perfected his operative experience with cancer of the cervix at a very dear price and you may remember that his mortality in the first 100 cases was nearly 25 per cent I am

quite sure that no American would have gone on operating with such results He reduced his mortality finally however to about 14 per cent, but the operation is a difficult one and few men have sufficient opportunity to learn to do it well but no matter how well it is performed if it is not done before the cancer cells have advanced into the tissues outside the uterus some of them may be left in the operative field

The question has naturally arisen from the remarkable success that attends the use of radium in some of the advanced cases whether the use of radium in the earlier case would not be better than operation I do not believe the question has been settled I know that some men are disinclined to operate in the early cases believing that the use of radium is better especially in a very old woman where the remaining period of life is not long at best and especially in epithelioma which is more amenable to radiation than adenocarcinoma One of the disadvantages in depending on radium is that we are uncertain of what it will do in the individual case In an advanced case of course it is the only recourse In the early days we used 85 grams for twenty four hours and when the patient returned at the end of a month we were elated with her improvement The patient felt much better The discharge had stopped We gave another dose and then sometimes the patient became worse As a result of this experience we now give all the radium we can at the first application and plan to use no more Just why repeated applications do harm is not altogether clear to me and I might say that under certain conditions as for example an easily accessible area of pure carcinomatous tissue second applications may be used with advantage In the majority of the cases we give one large dose and let it go at that using 150 mgm of radium and leaving it in the cervix for twenty four to thirty six hours If the patient has a marked reaction excessive nausea and vomiting marked pain or high temperature (102° F) we take it out before the time elected We have been having all cases subsequently treated with the *x* ray, but I am very much in doubt as to the value of the *x* ray after radium treatment for cancer of the cervix It seems in many cases to hurt the patient,

and I am not sure that it is a wise plan to use it. The patient is usually relieved of symptoms after the use of radium, but when we start the *x*-ray her condition gets worse and she complains of pain and other symptoms

The Wertheim operation is a complete hysterectomy with the removal of the upper part of the vagina and the parametrium.

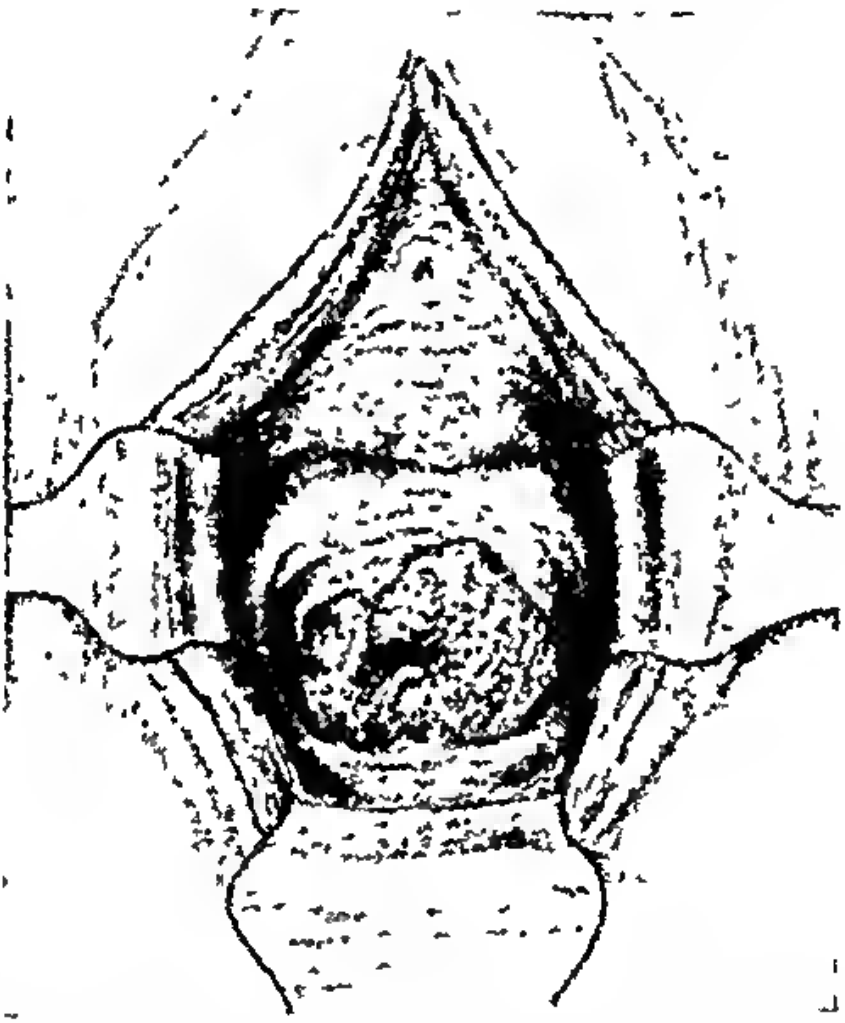


Fig 558.—The cancer of the cervix exposed by vaginal retractors, showing involvement of the greater part of the cervix and beginning extension to the vaginal wall

Many operators expose the ureter and get the uterine artery far out, and some of the parametrium, but when it comes to being sure that you get all of it, the proposition is a difficult one, and unless one has had an unusually large opportunity to operate on these cases, he does not do it. I therefore question the advantage of the operation over radium unless the cancer is confined

to the cervix and the patient is comparatively young. The difficulty is that one can never be certain that some of the cancer cells have not entered the lymph vessels or the glands in the broad ligament, even though the disease appears well confined to the cervix, in which case a radical operation, even though skilfully done, may fall just short of achieving its purpose. Nevertheless, the latest statistics of Wertheim should be kept in mind in our comparison of the results of operation versus radiation.

The advantage of using radium is, of course, the low operative mortality and the trivial inconvenience to which it puts the patient; however, until there are sufficient statistics to show that the use of radium alone gives as good an absolute percentage of cures as operation, I shall feel like doing an operation if the case is early enough. If one has elected to do a radical operation for cancer of the cervix, it would seem wise to radiate the cancer previously, so that any escaping cancer cells would not consequently grow. I have done this, using the radium for twenty-four hours preceding the operation. Some of my friends in New York tell me it is better to wait for ten days. I question, however, in the light of my experience, whether either plan is as good as the thorough use of the actual cautery just before the operation is done. The proportion of cancer we get here in the operable stage is very small. They nearly all come in well advanced. This is almost invariably true of dispensary patients, and every once in a while it is true of the most intelligent. Sometimes cancer of the cervix is very insidious, but mostly the patients are not aware of the significance of the symptoms or they are afraid to find out the truth.

You will observe that Dr. Scheffey does not scrub inside the vagina, it being our plan to disturb the condition as little as possible. If the cancer is infected, as, of course, it probably is, the scrubbing will not do any good, and it may produce a lot of hemorrhage. We clean up as well as we can by just pouring the solution into the vagina. The cervix is not destroyed; I can still feel it projecting into the vagina, but the entire periphery is involved close to the vaginal attachment (Fig. 558). The cervix is

enlarged and the entire mass is fairly movable I am not sure that there is extension of the cancer into the broad ligaments, but it is extremely likely, it is not a case in which the chance of removing all of the cancer by an operation is at all good, and so we depend

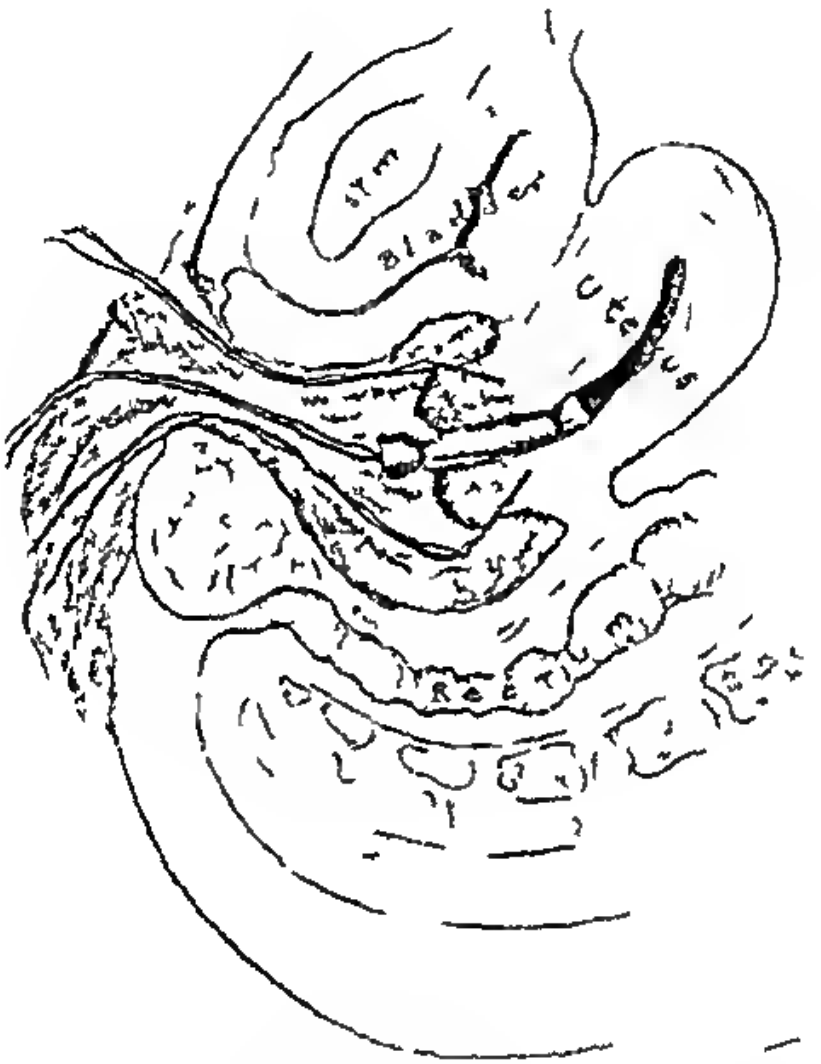


Fig 559 —The 50 mg capsule has been placed in the center of the carcinomatous cervix The position of the 12½ mg needles and the gauze pack is indicated

on radiation If the cancer is a proliferating, redundant and fungus mass we remove the excess of it with a cautery knife but we do not use the curet A specimen is taken for microscopic section by means of the cautery knife

In this case we will apply 50 mgm to the cervical canal and

eight needles of 12.5-mgm. each to the periphery, four posteriorly and four anteriorly. The destructive effect of the radium does not extend more than 2 cm., and we bear this in mind when placing the needles. I am careful not to plunge the needle into

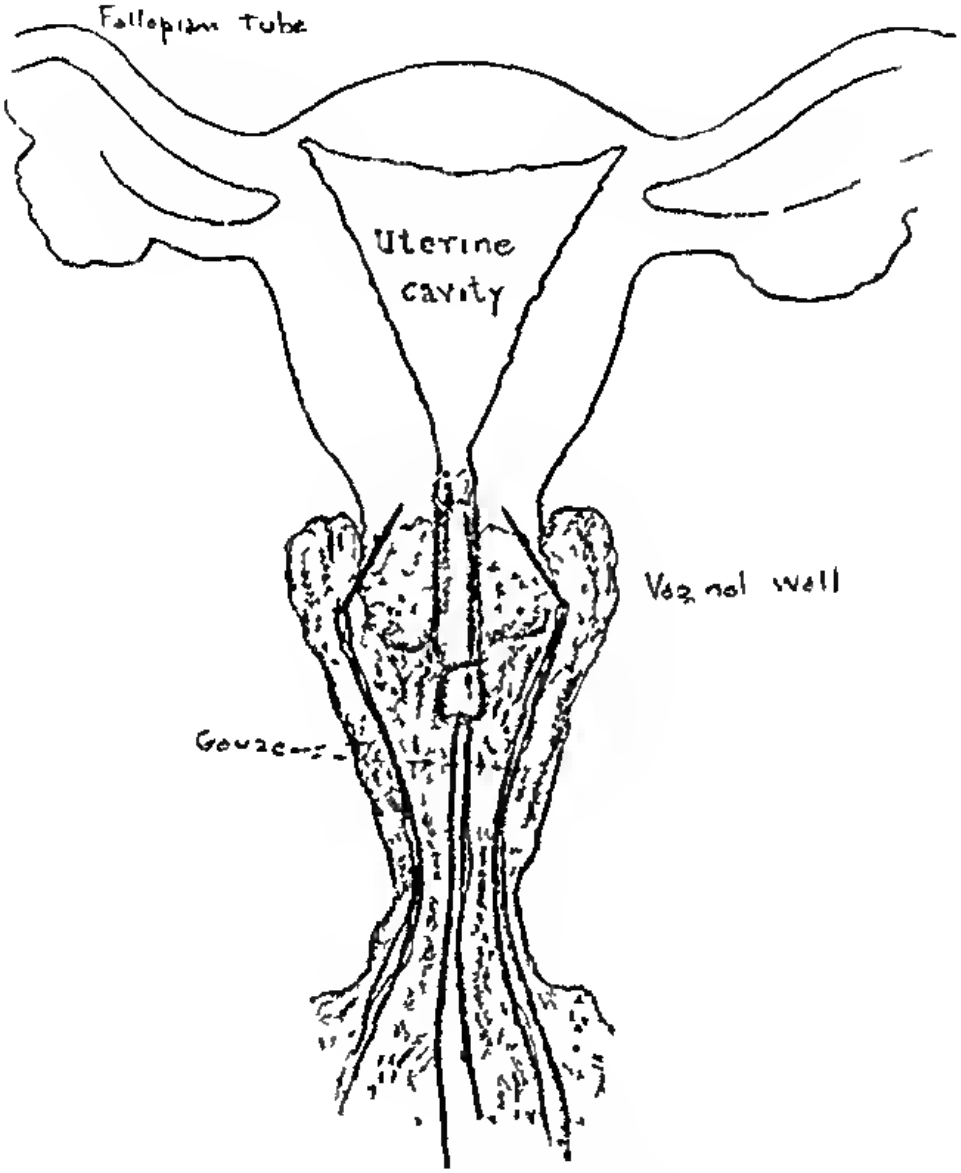


Fig 560.—Radium capsule, needles, and gauze pack.

the peritoneal cavity. We now begin the disposal of the gauze pack. We begin to pack in the posterior vaginal fornix, back of all of the needles in order to support their butts, and to push away the vaginal wall. The entire length of gauze is in one piece, and it is threaded through the loops of silk attached to

the radium capsule and to each needle in order to facilitate the removal of the radium (Figs 559 560)

QUESTION Is the dose you are using an average dose?

ANSWER No it is a maximum dose we leave it in twenty four hours which means 3600 mgm hours

This woman has been having a foul discharge We shall tell her to come back in four weeks If the treatment is successful she will return smiling telling us the discharge has not been troublesome that she has had no bleeding but perhaps a little watery discharge On looking at the cervix we shall find that the mass has shrunken and in what was the center of the cancer we will see a grayish slough In two or three weeks after that this slough will disappear and the opening will have almost entirely closed and the entire mass of the cervix will be greatly reduced

Having put in the remaining needles we coat the gauze with plenty of vaselin because it saves the vaginal mucosa from irritation we put in enough gauze to hold firmly so that no matter how much the patient coughs or vomits she will not force the radium out of position A radium case is always provided with a special nurse one of her duties is to see that there is no displacement of the gauze pack because the retention of the radium in the place elected is one of the prime requisites of success

CLINIC OF DR LEON HERMAN

Pennsylvania Hospital

Your presence here indicates that you have a special interest in urological surgery We will show therefore some cases which present unusual difficulties in the diagnosis and treatment of urogenital lesions

ADVANCED UROGENITAL TUBERCULOSIS DISCUSSION

This young man is suffering with advanced urogenital tuberculosis He was referred to us for an opinion regarding the possibility of successful operative treatment and brings with him a letter describing in detail the results of an examination made elsewhere two years ago We find that his physician thought at the time that the disease had already advanced beyond the operable stage that it had invaded both kidneys with the major involvement on the right side Two years ago the right kidney was excreting tubercle bacilli, and the function as measured by the excretion of phthalein was just half that of the left kidney The latter was infected, but was normal in function, and the laboratory examination failed to reveal the presence of tubercle bacilli in the urine from this kidney Nevertheless it was thought that the disease was bilateral, and that removal of the right kidney offered little even as a palliative measure Two years have passed, and despite the presence of wide spread urogenital tuberculosis we see before us an individual whose general appearance is certainly not that of a very ill man This is not unusual in these cases but I think we may conclude that the natural resistive powers of this patient are somewhat greater than those exhibited by the average tuberculous subject You will observe that the right hip is ankylosed, and here are the scars of numerous ancient fistula, all of which are firmly healed

Both epididymes are enlarged and nodular throughout and here on the most dependent portion of the right side of the scrotum is a discharging sinus The vasa are thickened and nodular The prostate gland and seminal vesicles are less involved than might be supposed in the presence of so extensive a disease of the epididymes

I will ask some of you to examine the patient s abdomen You discover a rounded non tender movable mass in the region of the right kidney which we assume to be an enlarged kidney The left kidney is not palpable This mass may represent a normal kidney which has become enlarged to compensate for pathologic destruction of its fellow but opposed to this hypothesis is the knowledge that the right kidney was low in function and was excreting tubercle bacilli two years ago so that it is altogether likely that the mass which we feel represents an enlarged tuberculous kidney Some of you may have seen the cystoscopic examination made in this case several days ago You will recall the difficulties encountered first because fixation and adduction of the hip together with deviation of the urethra made the introduction of the instrument difficult and second because as the result of ulceration the bladder is small in capacity and extremely intolerant We learned, however from this examination that the major portion of the ulceration is confined to the region of the right ureteral orifice and that the latter is craterform We find furthermore that the right ureter is obstructed in the midpelvic portion Obviously the right ureter is functionless its walls thickened the mucosal lining ulcerated and the sphincter muscle destroyed The vesical ulceration is largely confined to the right side of the trigonum and adjacent bladder walls, but there is in addition a generalized cystitis present and the mucosa in the region of the left ureteral orifice is quite edematous

Our attempts to introduce a catheter into the left ureter were unsuccessful The routine laboratory studies yielded the information that the patient possesses adequate renal function the total output of phthalein is 40 per cent and there is only a slight retention in the blood of nitrogenous products The

question arises, are we to interpret the findings as being indicative of the presence of a unilateral renal tuberculosis, and are we justified with the data at hand in advising nephrectomy? Other considerations concern the probability of prolonging life, or promoting comfort by the operation, and, from the technical side, whether nephrectomy and bilateral epididymectomy should be done at the same time or at different sittings.

Two years ago the right kidney was excreting tubercle bacilli, but retained a considerable degree of functional activity; it has now become enlarged, and from the condition of the lower ureteral segment I should say that the kidney was entirely functionless; there can be no question that it is the seat of advanced tuberculosis. This knowledge, together with the results of the laboratory studies, permits us to assume with reasonable accuracy that the left kidney is a fairly normal organ. The left kidney may be tuberculous, it may have been tuberculous two years ago, but this would seem extremely unlikely. We may be able to obtain additional information by cystoscopic examination under sacral anesthesia, and especially by means of the indigocarmin test (chromo-ureteroscopy), but the presence or absence of left renal involvement will remain problematic unless we succeed in obtaining urine directly from the pelvis of the kidney. It is always the scource of much chagrin to be compelled to operate on a renal lesion in the absence of complete cystoscopic and pyelographic data, but in this instance the major consideration, in my opinion, is the probable effect on the bladder of removal of the right kidney which is unquestionably the seat of advanced tuberculosis You may ask if this will not depend upon whether the left kidney is tuberculous, and if so, whether the disease is active or quiescent. In answer to this I would again call your attention to the fact that over a period of two years the left kidney has assumed successfully the entire renal function, which it would scarcely be able to do in the presence of an active tuberculous process. I doubt very much if any form of treatment will serve to restore the bladder to its normal state; we are concerned with the surgical means of aiding nature in healing the existing bladder ulcerations, and this can

be accomplished only by removing the foci whence infectious material comes to the lower urinary tract I would favor the removal of the right kidney and both epididymes at the same sitting if expedient

Much has been said about the uselessness of epididymectomy for genital tuberculosis but this operation followed by *x* ray therapy has served to control the disease in the vast majority of our cases When the disease is unilateral we remove the diseased epididymis together with a segment of the vas on the apparently healthy side The operation is almost invariably followed by quiescence of the disease in the prostate and seminal vesicles especially in those cases without urinary tract involvement There is no reason to perform castration in these cases unless the body of the testis has become actually invaded by the disease which process is long deferred owing to the marked resistance to tubercular invasion of the tunica albuginea

The surgery of unilateral renal tuberculosis is as you well know quite satisfactory in so far as the immediate results are concerned since the primary mortality is extremely low About one half of the patients are completely and permanently cured in some cases the progress of the disease is augmented and the patients die either as the result of general dissemination of the disease or more often as the result of the involvement of the opposite kidney while in another group the operative results are quite satisfactory but a considerable morbidity remains owing largely to persistence of vesical ulceration In the case under discussion I would not anticipate any postoperative difficulties except as concerns the treatment of the existing bladder ulceration We have tried many local measures in the treatment of vesical tuberculosis with indifferent success and have come to rely chiefly on deep *x* ray therapy in limited dosage light fulguration of well localized ulcerations and the biweekly instillations of a mixture containing guiacol 3 calomel 5 in sterile olive oil 100

We present the next case as another illustration of advanced

The right kidney was removed by Dr John H Gibbon and the bladder has shown very remarkable improvement

urogenital tuberculosis in which the vesical involvement is of major importance. This young man has been under our care for three years. You will notice that he wears a urinal, necessitated by the fact that the bladder capacity is only about 1 ounce. He suffers no pain unless an attempt is made to retain the urine, and there is no hematuria. The patient's general health is quite good, he has been gaining in weight, and is able to work daily in a clerical capacity. Three years ago our examination led us to conclude that the disease in this instance would prove rapidly fatal. There is bilateral renal involvement with calcification in both renal areas, as shown by the roentgenogram. The bladder is extensively diseased, and at the time of the initial examination was badly ulcerated. In addition to the urinary tract involvement there was wide-spread genital tuberculosis. Some months ago we resected both epididymes, and since then the extensive disease of the prostate gland and seminal vesicles has improved at least 75 per cent. in so far as we are able to judge by palpation. In addition, vesical pain, tenesmus, and hematuria have disappeared, but the bladder is so contracted that it is necessary for the patient to wear the urinal.

You will note from the condition of the skin in the suprapubic area that the patient has had considerable irradiation. It is almost too much to expect that the renal tuberculosis will heal spontaneously, hut in this instance it would seem that it has become quiescent. The function of the kidneys as measured by the output of dyes has improved during the three-year period.

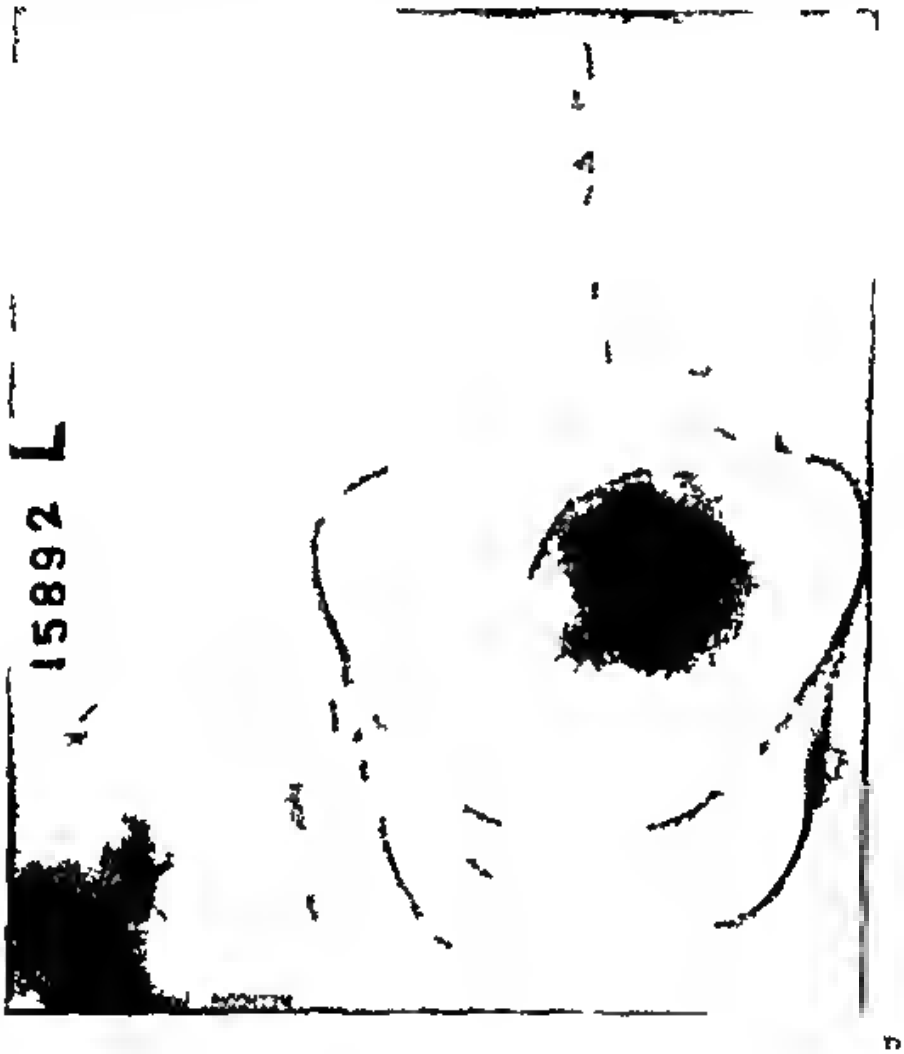
I would like next to call your attention to several unusual cases of vesical diverticulum. The first patient was operated upon for an enormous dumbbell stone, the larger segment of which completely filled the diverticulum, taking origin from the right side of the bladder (Figs. 561, 562).

DIVERTICULUM WITH STONE

Case History.—Mr. C. A. B. H., aged forty-one years, was referred for examination by Dr. James Shelly, of Ambler, Pennsylvania, on July 31, 1925. The major complaint was inter-

mittent attacks of hematuria This was associated with a burning pain during voiding referred along the course of the urethra and pain on holding the urine

Present Illness —The patient states that his present trouble began in March 1925 with burning on urination The urine



two segments were articulated and were held together by the neck of the sac

was examined at this time and was found to contain pus Dr Shelly tells us that there was some frequency of urination for a long period of time and the patient admits to occasional nocturia but he had become so accustomed to this that he did not consider his bladder function abnormal in any way In June

1925 he began having rather severe pain when the urine was retained for an hour or longer. This was relieved by voiding, but the act of micturition was associated with considerable burning in the urethra. The frequency became more marked and urgency increased. He does not recall when the hematuria began, but is rather certain that no blood was noted before the onset of the severe pain. On admission the patient was suffering greatly with

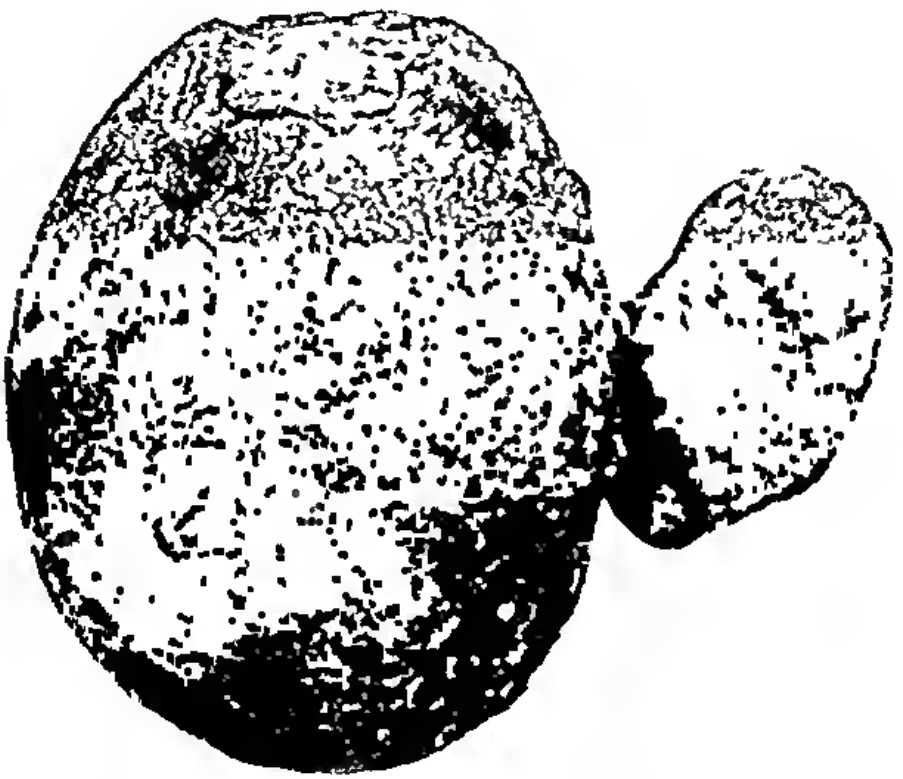


Fig. 562.—(See also Fig. 561.) Photograph of a giant dumb-bell calculus the larger segment of which was contained in a bladder diverticulum

dysuria, frequency, and urgency of urination; the urine contained much slimy pus and blood

Past Medical History.—In 1918 a small stone was passed from the bladder to the fossa navicularis of the urethra, where it became impacted; a meatotomy was performed and the stone removed. After this he remained well so far as the bladder was concerned, except as above noted. There was the history of a mild attack of urethritis and a small soft sore eighteen years

ago In December, 1925 he had what his physician thought was an abscess of the right lung, this was said to be tuberculosis by the roentgenologist It is of interest to note that Dr Piersol

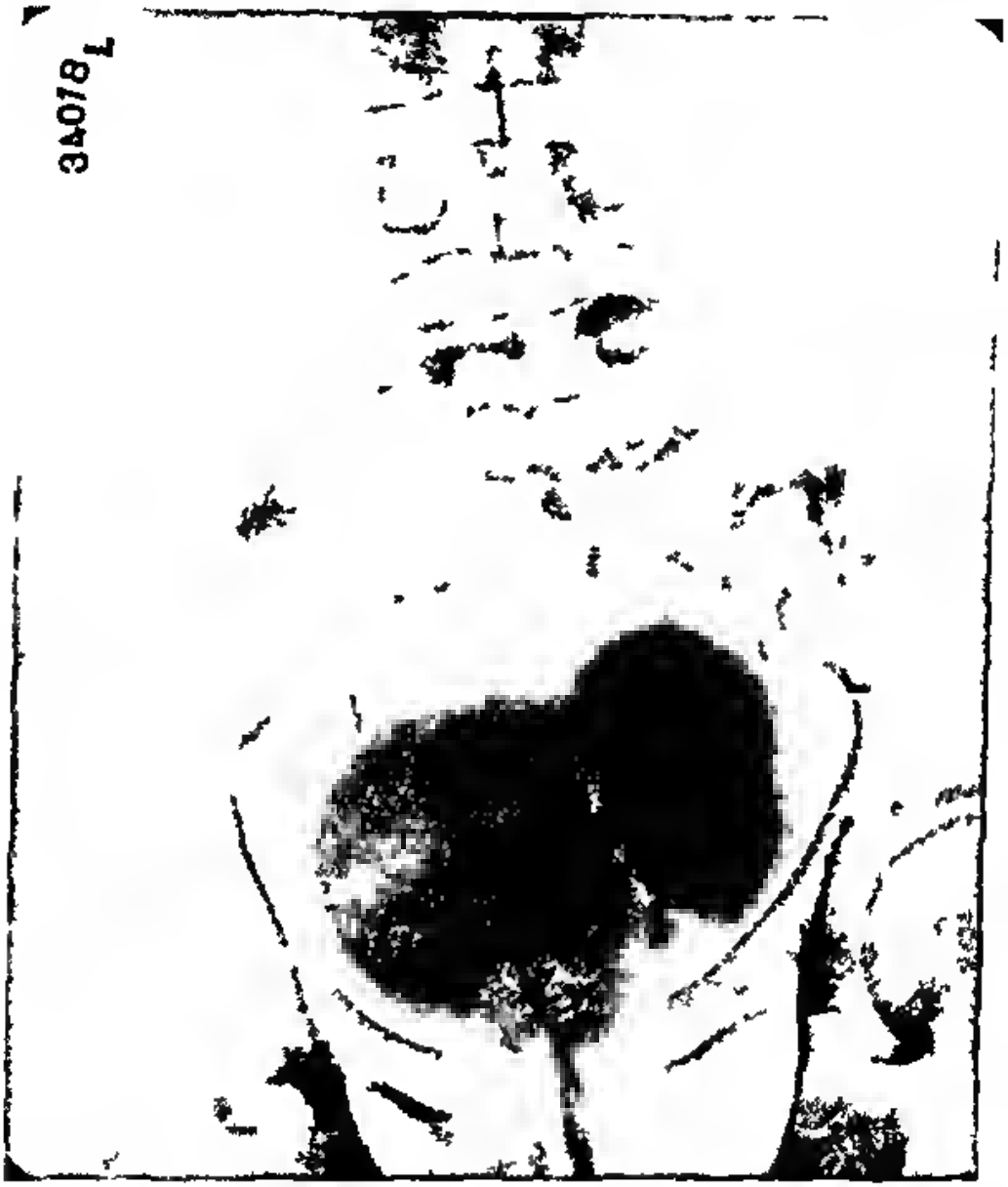


Fig 563 —Cystogram No 34 108 Pennsylvania Hospital Philadelphia The patient a man aged thirty two years Diverticulum resected extraperitoneally A portion of the sac wall was used to close the bladder defect the diverticulum recurred Reoperated with total excision of the diverticulum Patient cured

demonstrated changes in the physical signs in this area without knowledge of the previous x ray findings which would indicate that the lesion had left permanent scarring There did not seem to be sufficient change to justify the diagnosis of tuberculosis

Examination.—The patient presented himself as an office patient on July 31, 1925. At this time he was voiding small amounts of urine frequently and with evident distress The urine was filled with slimy pus and blood. On examination, we found

Fig 564.—Cystogram, No 16,629, Urological Department of the Methodist Episcopal Hospital, Philadelphia Diverticulum of the urinary bladder and carcinoma of the prostate Total excision of the diverticulum with prostatectomy

nothing of importance except a very large, smooth mass of stony density by rectal touch. The mass was situated above the prostate gland, which seemed to be normal, and occupied apparently the bladder. It seemed to be in the midline, although the *x*-ray shows it to be more to one side (Fig. 561).

Operation.—The bladder was opened through a left rectus

incision The portion of the stone which projected into the bladder cavity was loosely attached to the diverticular portion, this segment was removed The diverticulum was then exposed and a crucial incision made in its upper wall The stone was found to be intimately attached to the mucosal lining and was so tightly impacted in the sac that its removal was effected with some difficulty The incision in the diverticulum was closed and the cavity drained by a rubber tube passed through the opening into the bladder The convalescence was uncomplicated, but as is to be expected there remains a chronic cystitis

The important technical problem in cases of this kind concerns the disposition of the diverticular sac In this instance, owing to the considerable difficulty encountered in removing the stone and the presence of a very advanced and active inflammation the diverticulum was not removed It was impossible to remove the mucosal lining alone and to do a radical resection would have necessitated the opening of the paravesical space widely, which did not seem justifiable in the presence of so much infection Again the removal of the sac does not insure the cure of the existing infection, in fact, it would seem that the persistence of infection and the recurrence of calculi is as likely to take place after resection of the diverticulum as after the conservative operation However, the retention of the diverticulum cannot be looked upon as complete surgery and in cases of this kind in the absence of definite contraindications it would be advisable to remove the diverticulum with the stone In this instance there was no complicating obstruction at the bladder outlet

It has been our experience that complete excision of bladder diverticula usually insures a cure, and that the repair of the defect in the bladder wall should be made by approximation of the healthy bladder wall, utilization of a part of the diverticular sac for the purpose invites failure for the reason that the walls of diverticula are lacking in healthy muscular tissue and recurrence of the diverticulum is very likely to take place In cases in which the ureteral opening has been drawn into the cavity of the diverticulum it is necessary either to transplant the ureter

into a healthy part of the bladder wall, and excise the entire sac, or to use that part of the sac containing the ureteral opening to close the bladder defect after partial resection of the diverticulum We have never employed the latter method and would strongly advise against it in the belief that recurrence of the diverticulum would be almost sure to occur This opinion is based on our experience with a recurrence in a case in which part of the sac wall was retained, in this instance the diverticulum originated from the lateral wall of the bladder without involvement of the ureter

RECURRENT DIVERTICULUM OF THE BLADDER

Case History —M P , aged twenty six was admitted to the Urological Out patient Clinic of the Pennsylvania Hospital March 22, 1923, complaining of dysuria Four years before admission he had had an attack of acute gonorrhea since which time there has been a urethral discharge One and a half years ago he developed bladder pain, foul smelling urine severe burning on urination, and some frequency The examination at this time (in Roumania) led to the diagnosis of pyelitis Before coming to the Pennsylvania Hospital he was treated for several weeks at another Philadelphia hospital for cystitis Our examination revealed the following hypospadias with very small meatus and a small para urethral canal above the meatus Right sided varicocele Urine very cloudy and pus laden No tubercle bacilli found Prostate very irregular, indurated, and tender Both seminal vesicles chronically diseased Secretion laden with pus Many examinations of the secretions failed to disclose the presence of the gonococcus The Wassermann test was negative *x* Ray examination of the urinary tract was reported negative for stone A cystoscopic examination in the clinic led to the diagnosis of cystitis and bilateral pyelitis, and the patient was referred to the house for further examination and treatment The second cystoscopic examination seemed to confirm the diagnosis of pyelitis but owing to the marked trabeculation and inflammation of the bladder the opening of

the diverticulum was not noted After several irrigations of the renal pelvis the pyelitis and cystitis improved and the presence of a diverticular opening was noted on the right wall of the bladder just lateral to the ureteral orifice (Fig 563) On May 2 1923 the diverticulum was resected leaving behind a small flap with which the opening in the wall of the bladder was closed

The convalescence was unsatisfactory in that the cystitis failed to show the expected improvement and the suprapubic sinus was delayed in closing In August 1923 a cystogram was made which showed the presence of a diverticulum almost identical in size and shape with that found in the original examination Reoperation was advised and the recurrent diverticulum was excised and the bladder wall repaired very carefully by inverting the edges and approximating the mucosa with a running suture followed by placing two layers of interrupted sutures externally which latter included all of the walls of the bladder except the mucosal layer The diverticulum was adherent to the ureter but was separated without great injury to the latter The convalescence from this operation was complicated by very troublesome right sided acute pyelonephritis The wounds healed rapidly but with each attempt at voiding the patient was seized with severe pain in the right kidney followed by attacks of fever chills and sweats An indwelling catheter either in the urethra or ureter prevented these attacks It seemed at one time that the right kidney would have to be sacrificed but after numerous lavages of the pelvis normal urination was re-established and the patient made a very satisfactory recovery Subsequent cystographic examinations show a normal bladder outline and the ureterovesical sphincter is continent although *I feel* rather certain that *immediately* succeeding the operation there must have been a free communication between the bladder and right ureter We have seen this condition in cases of urethral stricture and other obstructive diseases of the lower urinary tract and it may prove to be a disturbing factor during the convalescence period after urethral prostatic or bladder operations

In the 2 cases just described we could demonstrate no obstructive lesion at the bladder outlet although the majority of diverticula are associated with and probably in part due to such obstructions That is with an inherent weakness of the bladder wall at some point, sacculation is prone to occur with the increased intravesical pressure incident to the urinary obstruction Many of these cases are associated with median bar formation, which in some instances at least would seem to be congenital in origin We have recently done a punch operation on a man of thirty years, who had had urinary difficulty since early childhood In addition to the bar he presented two diverticula, one at the site of either ureter, with the ureteral orifice in each instance situated on the margins of the diverticula opening In another comparatively young man there were multiple diverticula associated with a very pronounced bar This patient had led a catheter life for three years before coming for operation In cases of this kind the cautery punch operation will serve in the great majority of cases to re establish normal urination, and unless the diverticulum is large and single and so situated that total excision is easily accomplished one had better rest content with removal of the bar The surgery of multiple bladder diverticula situated in the trigonal area is not completely satisfactory, whatever method of enucleation is employed

In cases of diverticula associated with prostatism in which the latter is due to fibrosis of the prostate the diverticulum and the prostate should be removed at one sitting with or without preliminary bladder drainage I refer now to cases in which digital enucleation of the prostate is impossible and its removal is a matter of sharp dissection In Fig 564 is illustrated a case of moderate-sized diverticulum associated with a very hard, fibrous, nodular prostate This patient was operated upon by Dr Pfeiffer and the writer, and the only difficulty encountered was in excising the prostate which resembled grossly a sclerosing carcinoma[1] The subject was an aged man, but, despite the considerable surgery and marked surgical shock immediately succeeding the operation, he has done very well

[1] Microscopic sections showed the presence of carcinoma

CARCINOMA OF THE PROSTATE GLAND VERSUS INTERSTITIAL PROSTATITIS

We will now operate upon the next patient He presents a combination of lesions which renders surgical treatment rather difficult and the prognosis uncertain He has a hard slightly enlarged nodular prostate the physical condition of which suggests carcinoma There seems to be some extension of the pathology into the right vesicular area although the disease has not extended in the characteristic subtrigonal manner From the physical nature of the lesion as determined by rectal examination we are inclined to believe that it is carcinomatous However *it is not the usual clinical type for the patient has great* urinary difficulty far greater in fact than one expects to find associated with the malignant prostate except in the advanced stages of the disease This patient s urinary difficulties are undoubtedly due to urethral obstruction but not we believe to malignant invasion of the urinary tract from a primary prostatic carcinoma There is the history of previous urethral obstruction About twenty years ago this man was treated for a filiform stricture by gradual dilatation and since that time he has noted more or less diminution in the size of the urinary stream which within the last few months has become a mere dribble This is the history of stricture although one might expect more rapid contraction of the scar On examination of the urethra we find the presence of extensive scarring of the entire penile portion of the canal which will admit an instrument (Size 13 F) to the level of the bulbous segment At the latter point there is a very dense obstruction through which we were able to pass only a filiform guide There is no calculus demonstrable We will expose the prostate through a perineal incision and attempt to open the urinary tract and at the same time implant radium in needles if the findings justify the belief that we are dealing with a prostatic carcinoma The preoperative diagnosis then is filiform stricture of the urethra at the bulbomembranous junction extensive stricturing of the anterior or penile urethra together with a nodular condition of the prostate which may be carcinomatous or inflammatory We have passed

the guide of a Le Fort sound without difficulty, and after exposure of the urethra will follow it with the sound to be used as a guide The exposure is made as for prostatectomy Here is the central tendinous point of the perineum, having cut this, we retract the bulb forward, the lateral perineal muscles are retracted and we now see the recto urethralis muscle, and a mass of scar tissue With the finger in the rectum we demonstrate that the rectal wall is in no danger of injury, we are working forward of the point of urethral attachment Having cut the fibers of the recto urethralis muscle we should now be able to push the rectum backward, and see the urethra clearly together with the fascial coverings of the prostatic apex, but there is a dense mass of white tissue present which is foreign to the area, and this I take to be peri urethral scar, which in all probability is the cause of the urethral obstruction We will introduce the sound I can now feel the instrument in the urethra, but it is separated from the examining finger by a considerable depth of scar tissue

We will incise the latter in the line of the sound, note that it is at least ½ inch in thickness and very dense and white The urethral lumen is quite wide proximal to the scar, and you see there is no difficulty in introducing a large catheter into the bladder I will excise this scar tissue We now find a line of cleavage which permits us to separate the prostate from its posterior sheath As I work the finger posteriorly I can feel the nodulation which we felt through the rectal wall and upon which the suspicion of carcinoma rests I will ask Dr Burt to put on a pair of gloves and tell us if in his opinion this is malignant or inflammatory The doctor is of the opinion that it is inflammatory, and I am inclined to agree with him

We will again palpate the prostate per rectum One cannot be sure about this but I am not going to implant radium needles in the prostate, for it is apparently a case of chronic interstitial prostatitis I may say in passing that in our experience little benefit comes from treating carcinoma of the prostate by radium either in needles or by emanation seeds, but in the vast majority of cases one must either withhold all treatment except that

designed to keep the urethra open or choose between deep therapy and the implantation of radium We have had very poor results with the implantation of radium through a suprapubic wound it neither cures the patient prolongs life nor adds to the comfort of the patient If radium is used it should be applied through the perineum In cases with marked urethral obstruction the *punch operation may* serve to keep the canal open while in some instances the suprapubic removal of the prostate is the best palliative measure Let us not delude ourselves or the patients with the idea that our efforts in the treatment of prostatic carcinoma are curative for they are merely palliative except perhaps in some few instances

We will sew this tube into the urethra bringing it out through one limb of the perineal incision Within ten days we will either instrument the canal or if necessary do an internal urethrotomy to open the penile portion of the canal if it proves resistant to instrumental dilatation The thought may occur to you that it would have been the better practice in this case to do gradual dilatation of the urethra and had we been as sure that the prostatic condition is inflammatory as we now are we would have certainly attempted gradual dilatation

SUPPURATIVE EPIDIDYMITIS FOLLOWING PROSTATIC ABSCESS

Epididymitis caused by the colon bacillus in aged individuals is a very different condition than other forms of the disease such for instance as gonorrheal epididymitis This patient is as you observe a very ill man He gives the history of urinary difficulty followed by infection of the left epididymis From the history of the case and the physical condition of the prostate gland we are of the opinion that he has had a prostatic abscess which has broken into the urethra He has been entirely too ill to permit us to attempt an examination but the urine is laden with pus the kidney function is very low he has been running a febrile course and is quite septic

Several days ago the scrotum was incised and a large quan

tity of pus was evacuated We will remove the testicle and will find it necrotic You will note that the tunica is exposed, and that it is distended with fluid, a symptomatic hydrocele no doubt, but it may contain pus We have freed the scrotal contents everywhere except at the site of the previous operative incision We will excise the sinus together with a segment of healthy scrotal wall We will open the specimen the sac of the tunica contains clear fluid, note that the entire epididymis and the majority of the seminal tubules are necrotic Obviously, nothing short of orchidectomy would have sufficed in this case, we rarely succeed in saving the testicle in these cases by epi didymotomy, and if operation becomes necessary it is better practice to remove the testicle rather than to attempt to cure the condition by drainage of the epididymis, which is the pri mary seat of the infection in the testicle

CLINIC OF DR. HERBERT L. NORTHROP

HAHNEMANN HOSPITAL

EPITHELIOMA—DESTRUCTION BY ELECTROTHERMIC COAGULATION

ALMOST two years ago I removed an epithelioma by electrothermic coagulation from this man's lower lip. He is sixty-six years old, and now he presents a good-sized ulcerating mass on the margin of the mandible to the left of the median line (Fig. 565). This growth is hard, has raised edges, and an ulcerated center. Thereis no palpable submaxillary or submental adenopathy.

It is to be regretted that these patients are not more keenly alive to the real nature and possibilities of malignant lesions. We have so many cases of successful removal of a cancer and with no recurrence at the original site, which are neglected, and either ignore professional advice or do not seek it. Perhaps these patients are more or less self-satisfied and, I may say, even delighted to have a cure of the original cancer wrought, and they do not realize the possibilities of recurrence and metastasis. I believe that we should plan to educate cases of this kind regarding the possibility and dangers of metastasis.

First, I am going to ligate this man's external carotid artery in order to exsanguinate the region supplied by it and which contains the disease now demanding treatment. Of course, this is not a new step in technic, inasmuch as ligation of arteries and control of blood-supply has been practised for years. The same principle is applied to the ligation of the ovarian and uterine arteries in cancer of the uterus, and also ligation of the blood-supply of the mammary gland in the presence of certain neoplasms of the breast. Opening the neck will also serve

another purpose here, it will enable me to determine positively the presence or absence of infected lymph nodes You know as well as I that infected axillary nodes are often found at operation for the radical removal of cancer of the breast,

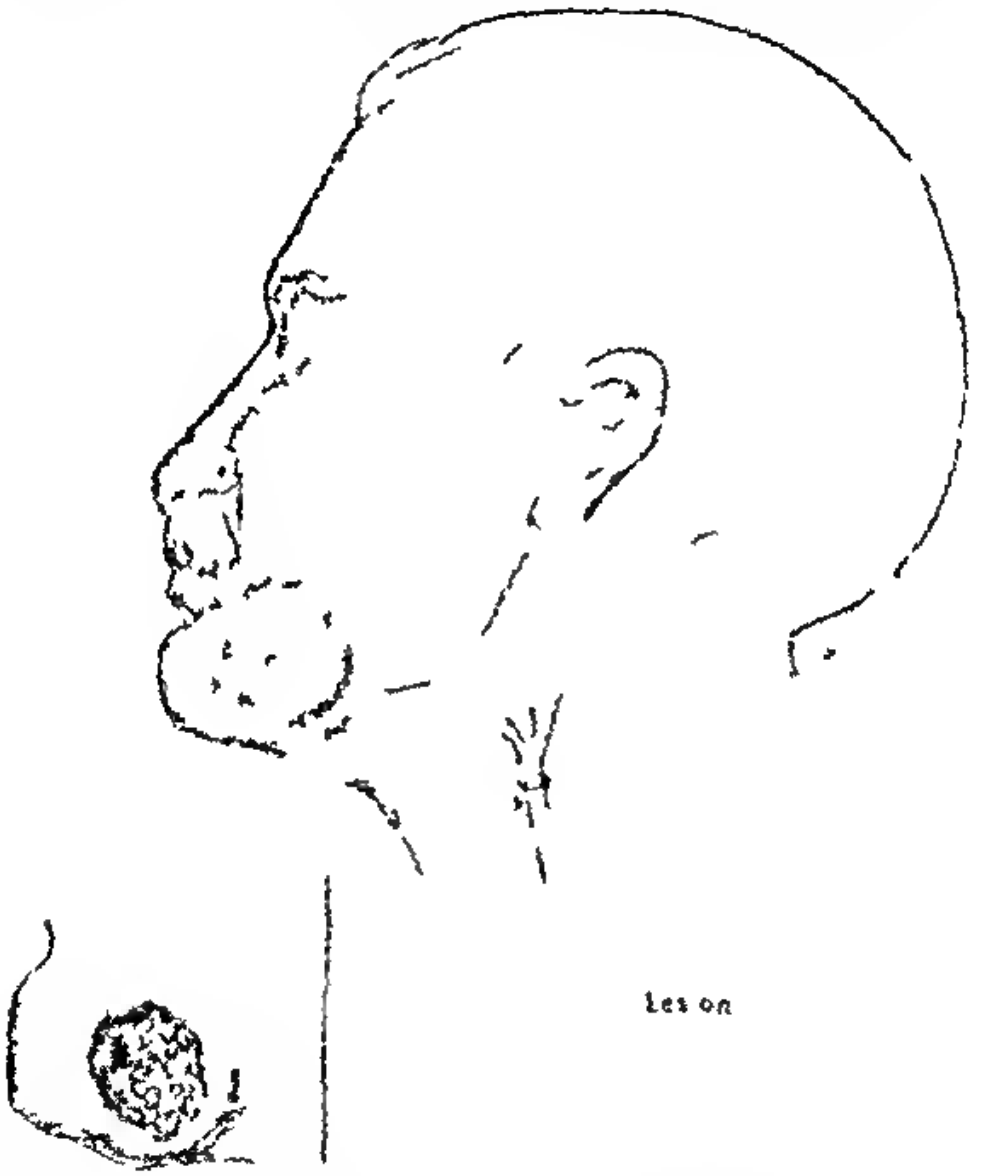


Fig 565 —Recurring epithelioma attached to body of mandible Insert The same after electrothermic coagulation

while those nodes could not be felt when the axilla was examined before operation, and the same applies to the neck

I have made a moderate-sized wound in this man's neck along the anterior margin of the sternomastoid muscle and it is an easy matter for me now to pass a ligature around the

external carotid artery, just above the superior thyroid branch, and thus shut off the blood supply through the remaining branches And here, as might have been expected, and not at all surprising, is a small, hard submaxillary lymph node which I will remove The neck wound can now be closed with a continuous equisetene suture and I will introduce a small Penrose drain at the lower angle

You who have used equisetene as suture material can endorse my recommendation of it as a skin suture It is superior to horsehair because it is stronger and can be employed in three different sizes It is good also because it leaves a minimum amount of stitch marking

Now comes the coagulation of the epithelioma This of course, must be done by using the d'Arsonval or bipolar high frequency current, with a large, wet, zinc pad in close contact with the skin of this man's back for one pole, the steel knife or needle will constitute the other pole And, as you see, I now encircle this lesion, which is about the size of a golf ball, with the high frequency knife, and destroy the surrounding tissue and base down to the body of the mandible Of course, the current enters and attacks the bone itself, which is a fortunate thing because this growth includes the periosteum and is intimately attached to the bone In three or four weeks a portion of this bone may be separated from the rest of the mandible and come away as a sequestrum Following that, however, the soft tissues will grow in, fill up the defect, and in due time the operation wound will have completely disappeared, and the resulting scar will, in all probability, be insignificant

Epithelioma of Vulva (Figs 577–579) —We have had 7 cases of cancer in this locality, have coagulated 5, and removed 2 by cutting, 1 of the latter died from recurrence and 1 of the coagulated cases (Fig 578) has died All the others have recovered

The after treatment of these cases is very simple and consists in the use of vaselin or some other ointment with a mild antiseptic—boric acid, peroxid of hydrogen, mercurochrome etc

another purpose here, it will enable me to determine positively the presence or absence of infected lymph-nodes You know as well as I that infected axillary nodes are often found at operation for the radical removal of cancer of the breast,

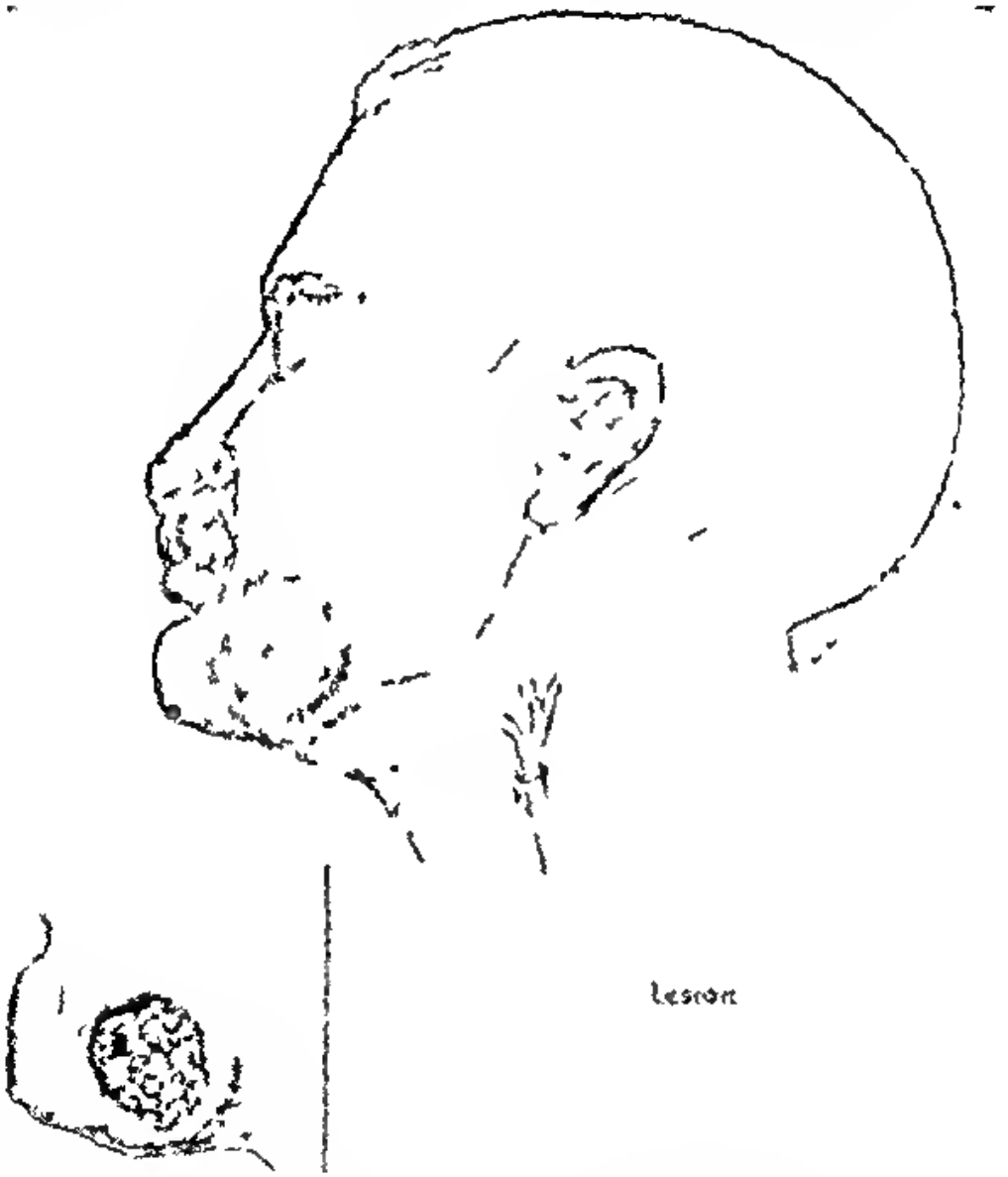


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Fig 568 —A McQ , age fifty nine Basal cell epithelioma of lower lip, previously destroyed by corn salve (Freezone) Seven years ago pimple on chin *near* lip electrothermic coagulation January, 1922

Fig 569 —Same case as Fig 568 December, 1925, after restoration of lower lip by nasolabial flap No recurrence at present date

Fig 570—E B age seventy seven Basal cell carcinoma of forearm involving deep structures coagulation of the same, and because of involvement of muscles and tendons forearm was amputated Complete recovery and no recurrence one year later

Fig 571—Lower lip after coagulation of epithelioma

Fig 572 —Same as Fig 571, after restoration of lip by nasolabial flap

Fig 573 —Epithelioma of auricle coagulation of same, with later removal of squamous portion of temporal bone, revealing extension of epithelioma beneath involved dura complete removal of all disease, including dura, by coagulation, three right sided convulsions followed, one lasting for six hours, with complete recovery, perfect hearing on the left side, and no recurrence five years later

Fig. 574.—Final result, same case as Fig. 573.

Fig. 575.—Paget's disease of breast; dissection of axilla and coagulation of nipple and surrounding tissue. No recurrence six years later.

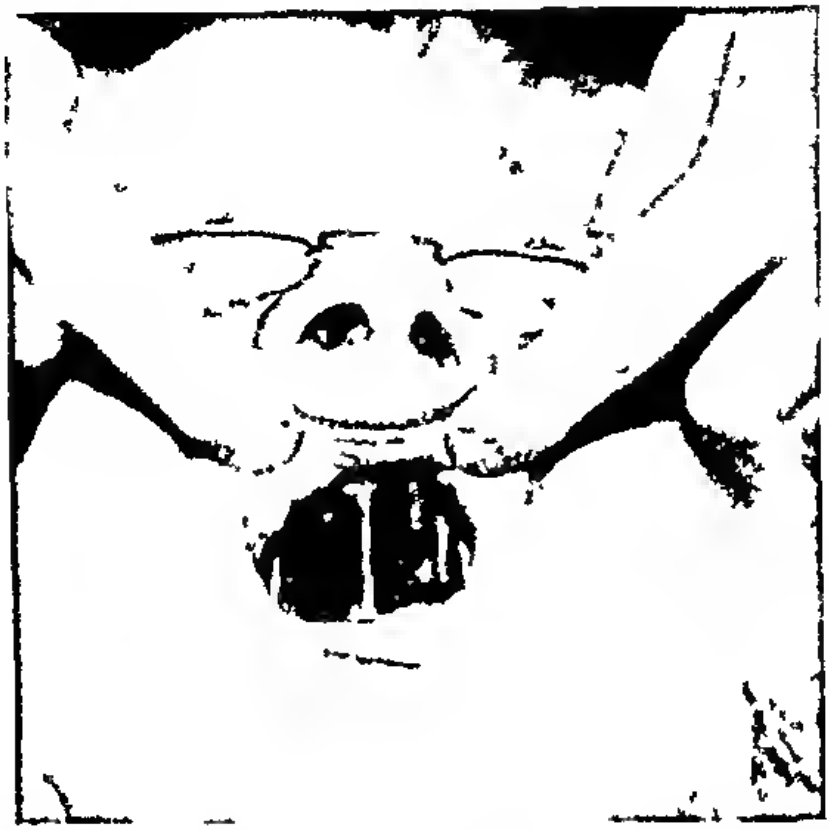

Fig 576 —E G age fifty five Epithelioma starting in alveolar process of mandible with extensive lymphatic involvement in neck removal of portion of mandible by cutting, block dissection of neck both sides two years later leukoplakia followed by epithelioma of almost entire hard palate coagulation of the same, removal of hard palate as sequestrum, opening into both nasal cavities now, five years later, patient is free from epithelioma and wears gold obturator with perfect satisfaction and function

Fig 577 —Epithelioma of vulva involving vagina and urethra Coagulation, complete healing and no recurrence one year later This patient had had three cutting operations performed previously

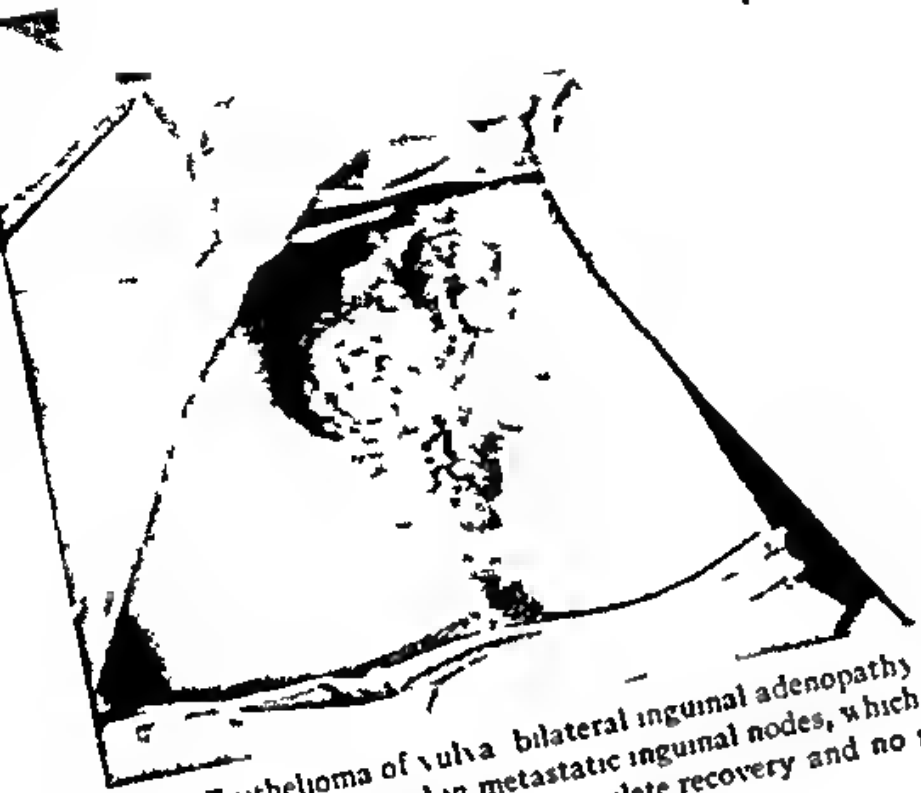

Fig 578 —Epithelioma of vulva bilateral inguinal adenopathy Coagu
lation of vulva radium inserted in metastatic inguinal nodes, which later had
to be enucleated and showed cancer Complete recovery and no recurrence
four years later

Fig 579 —Epithelioma of vulva extensive, ulcerating mass Coagula
tion to lessen offensiveness This patient was raped at sixteen years of age
gonorrhea and condylomata followed and forty years later, epithelioma

Fig. 580.—Keloid following a superficial scratch coagulated April, 1924, no recurrence, December, 1925

Fig. 581.—Present condition of case shown in Fig. 580

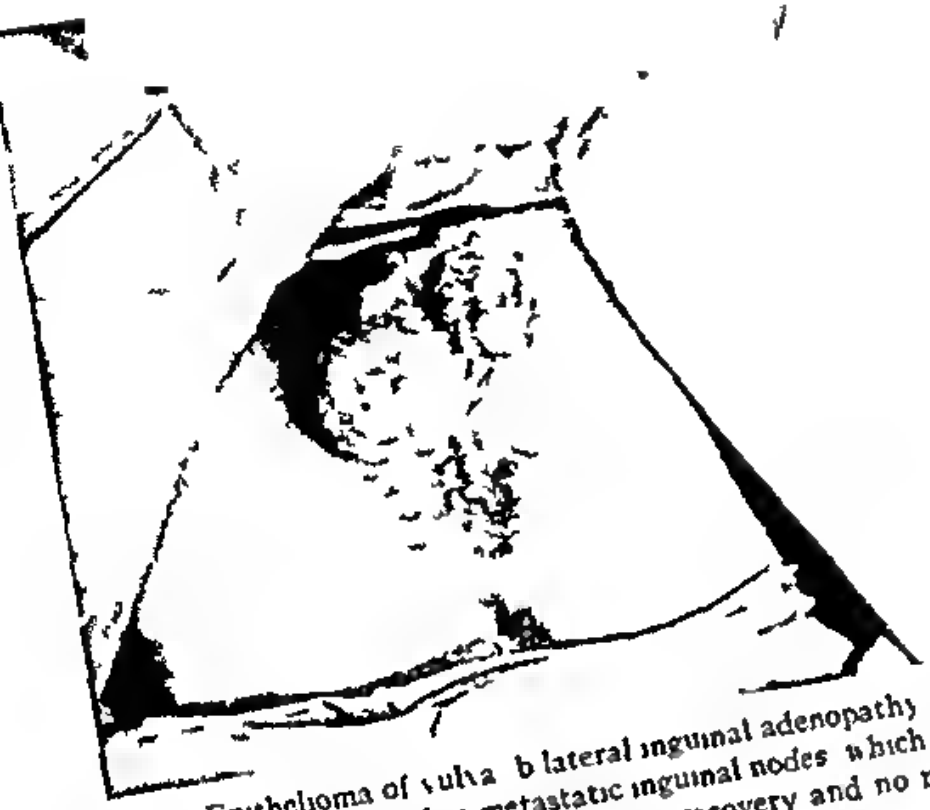

Fig 578 —Epithelioma of vulva b lateral inguinal adenopathy Coagu ation of vulva radium inserted in metastatic inguinal nodes which later had to be enucleated and showed cancer Complete recovery and no recurrence four years later

Fig 579 —Epithelioma of vulva extensive ulcerating mass Coagula tion to lessen offensiveness This patient was raped at sixteen years of age gonorrhea and condylomata followed and forty years later epithelioma

KELOID OF FOREHEAD

Although all keloids do not occur in negroes we know that the negro race is prone to this kind of lesion Here is a colored boy (Fig 582), eighteen years of age who was injured by a trolley car when he was three years old His forehead was cut, the wound was sutured and healed nicely, leaving but an insignificant scar One year ago however, this scar became thickened and raised, and has continued to increase in size until the present time It is also whiter, paler, than the surrounding integument In other words, it presents the usual characteristics of keloid formation We all know that excision of a keloid is most unsatisfactory and that recurrence is the rule We know, too, of cases of keloid where cutting operations have been done over and over, with recurrence every time During the last few years we have been removing keloids here by the high frequency d Arsonval current, and, so far, with no recurrence in any case In a few minutes I will show you on the screen pictures of a very large keloid which we coagulated one and a half years ago and up to the present time there is no recurrence Therefore there is apparently a great deal to recommend coagulation for the radical removal of keloids

This keloid, as you see, is a small one, and its coagulation and destruction are easily accomplished In this case I have used the needle, an ordinary large-sized sewing needle in order to limit the destruction of tissue as much as possible to the keloid itself

CAVERNOUS ANGIOMA OF LOWER EXTREMITY

This case (Fig 583) is a very interesting one to me because the disease is a serious one handicapping this young lady, who is twenty one years of age and incapacitating her for her work and threatening to seriously incapacitate her when she enters the marriage state, which she is planning to do From birth she has had a discoloration of the greater part of the left lower extremity, with numerous enlargements or swellings covering the dorsum of the foot the outer side of the leg and the anterior and outer

surface of the thigh with perhaps the most pronounced swelling or enlargement just below the patella These dilatations are soft

F g 583 —Cavernous ang oma venosum before the nject on of bo l ng ater Po nts njected marked by x

doughy and vary in size according to the position of the ex tremity If the leg is elevated they disappear entirely They are swollen more at night after the patient has been on her

feet during the day, than they are in the morning. Most of them are discolored and present the appearance of venous dilatations, somewhat like varicose veins. A close inspection, however, shows that they present a different appearance from an ordinary varicose vein, and because of the congenital origin of this condition we are prompted to make a diagnosis of angioma, which undoubtedly is also of venous character and cavernous. Pathologically speaking, this means that these venous swellings may be fed by either an artery or a vein, probably the latter, inasmuch as there is no pulsation in the tortuous swellings, and the cavernous character is to be expected because of the ease with which the blood disappears and the vessels are emptied when the extremity is elevated. We know that an angioma, a blood-vessel tumor, consists of numerous communicating spaces lined by endothelium as a part of the vessel wall, and, as a rule, these are congenital. Such conditions do not disappear spontaneously, open cutting operations are almost impossible, because of the intricate network of vessels and also because of the difficulty of controlling hemorrhage, which latter is also one of the possible complications during the life of the patient, as even a trivial traumatism may produce a troublesome, if not serious, hemorrhage. All this, of course, to say nothing of the cosmetic appearance, the physical deformity, and the subjective symptoms of fulness and weight, which these cases experience.

Several years ago the younger Wyeth, of New York, suggested and practised the injection of boiling water into these cavernous tumors in order to obliterate the vascular spaces and to destroy their endothelial lining. This treatment has been highly successful in Wyeth's hands and in the practice of many other good men throughout the world.

Three years ago I attempted the open dissection of a cavernous angioma involving the thumb, index-finger, and the web between of the hand of a young lady living in Trenton, and also extending into her forearm and upper arm. This was a difficult and protracted operation, but the result, notwithstanding the difficulties, was quite satisfactory. Later on, however, there was evidence of a recurrence, principally in the hand and at the

Of course, a truss would be out of the question in such a case and indeed truss treatment of femoral hernia is unsatisfactory it is difficult to keep the truss in position and it causes a great deal of discomfort to the patient, who is apt to discard it Femoral hernia is you know is more prone to strangulation

Fig 584 —Femoral hernia showing incarcerated omentum resembling lipoma

than other hernias so we have the best of reasons for advising radical treatment in these cases

My incision here is made above Poupart s ligament, just as if the hernia were of the inguinal variety I now get down behind Poupart s ligament and find a sac projecting out through the femoral ring into the upper part of the thigh which corroborates

our diagnosis of femoral hernia Opening the sac, I find a portion of omentum and a loop of ileum contained in it It is easy for me to withdraw the loop of ileum, but the omentum is adherent to the sac and, as you see, the permanent tumor in this case has not been reduced in size (Fig 585) It is, therefore, neces-

Fig 585 —The same as Fig 581, the omentum and sac drawn out preparatory to removal

sary for me to open the sac below Poupart's ligament and amputate the protruded portion of omentum Now that I have done this I can introduce a pair of forceps from above and pull up the stump of the sac above the pelvic margin, ligate it with a piece of kangaroo-tendon, and displace the stump upward

by carrying the ends of the ligature underneath the abdominal wall and coming out through the aponeurosis of the external oblique muscle This is done in order to obliterate the dimple on the inner peritoneal surface which is always looked upon as an invitation to a recurrence of the hernia at that point

The next step in this radical cure of femoral hernia by the inguinal route is to securely suture Poupart s ligament to Cooper s ligament and this I am doing with three Langaroo-tendon sutures I now have the femoral ring completely obliterated The operation is completed by dealing with the conjoined tendon and Poupart s ligament and the other structures of the inguinal canal just as if we were operating upon an inguinal hernia

Cooper s ligament deserves special mention inasmuch as it is hardly noticed in any text book on anatomy receiving at the best only a few lines or a short paragraph but it is a well developed tangible fibrous structure attached to the horizontal ramus of the pubic bone and which was first described by the celebrated Sir Astley Cooper In this case I have seen it and I am sorry that you could not have seen it for it is a well-developed beautiful fibrous band pearly white in color

The treatment of femoral hernia by the inguinal route is an operation which was performed accidentally by Annandale while he was operating for the radical cure of inguinal hernia In that case he discovered a coexisting femoral hernia upon the same side and then found how easy it was to deal with the femoral hernia through the inguinal approach Later he intentionally operated upon other cases of femoral hernia from above and the same has been done by other operators both European and American especially by Moschowitz of New York and other leading surgeons of this country

Personally I have performed the operation by the inguinal route at least 25 times during the last six or eight years and there is a great deal to recommend it I know of no recurrence in any of my own cases except in one where a portion of ileum had to be resected because of gangrene and infection of the wound followed weakening the buttressed structures and inviting a return of the hernia

CHOLECYSTECTOMY

This young lady, thirty years old, has gall stones I know it because I have seen them and felt them Let me explain Two weeks ago today I operated upon her for a duodenal ulcer She had been seriously ill for the past four or five months with indigestion, vomiting, pain in the upper abdomen and in September she vomited blood Her condition became quite serious and she showed signs of secondary anemia Her hemoglobin dropped to 50 per cent and her blood picture corresponded Her chief distress occurred an hour and a half to two hours after eating, and she had a tender point to the right of the median line above the umbilicus To my knowledge she had never presented any symptoms of gall stone disease although probably more or less of gall stone irritation, dull aching pain, indigestion, flatulency, etc , was mixed up with her symptoms of ulcer At my operation I found a good sized indurated whitened area on the anterior surface of the duodenum close to the pylorus The duodenum itself was deformed—somewhat constricted and irregular—but there was no stenosis of it Of course the surgical procedure in such a case is generally recognized to be a posterior gastro enterostomy with or without excision of the ulcer itself

While examining the upper abdomen I discovered a gall bladder filled with gall-stones, but thought it unwise to remove it at that time because of the major operation namely, gastro-enterostomy, being required

The day before this operation for ulcer it was deemed advisable to transfuse this patient, and she therefore received 500 c c of blood and 100 c c of saline solution This raised her hemoglobin to 85 per cent

Because of her poor general health and the anemia necessitating the transfusion, and also because the ulcer and the duodenum did not, to my mind, require any special local surgical measure, I performed the posterior gastro-enterostomy and closed the abdomen The patient's recovery from this operation has been not only ideal, but even brilliant, and she bid fair to get well and enjoy good health without any special postoperative

aid A week ago however she began to have severe and frequent pain in the right hypochondrium which required the use of morphin

When we informed this lady of the presence of the gall stones and that her pain was due to them she urged us to proceed with another operation A blood examination showed her general condition to be very much improved and here she is

As you see our operation wound of two weeks ago is perfectly healed and I will now make an incision parallel to and to the outer side of the first incision

I find hardly any adhesions in the neighborhood of the pylorus and gall bladder and the latter is easily brought into the wound the cystic duct clamped and a typical cholecystectomy performed Some (the American surgeons) advise the removal of the gall bladder from within outward others (notably the English surgeons) advocate its removal from without inward It seems to me a combination of the two methods is frequently the best technic to follow Now comes the question of the necessity and advisability of suturing the raw undersurface of the liver the fossa for the gall bladder It is our custom to close this by a suture of fine catgut and probably it is an advantage because it lessens hemorrhage and also the leakage of bile from the raw liver surface Another somewhat moot question is whether the subhepatic space should be drained and now the tendency is to omit drainage In our cases here we have drained some and not others and those not drained have done just as well and healed just as nicely as those that were drained Because of a slight localized fat necrosis which I have found in this case near the lower part of the scar from the former operation I will use a Penrose drain at the lower angle of this wound and thus drain the subhepatic space The parietal wound is now closed in the ordinary way layer by layer with Michel clips uniting the skin

(This patient made a splendid recovery from her second operation with freedom from pain and all other postoperative complications)

GASTROSTOMY

This man is unable to swallow even liquid food or water because of extensive pathology located in his larynx. Several weeks ago his family physician had his mediastinum *x*-rayed in order to locate the cause of this dysphagia. The *x*-ray examination did not disclose the cause of the obstruction, but it showed a large needle broken in two pieces lodged in the posterior mediastinum. This, however, is apparently only a passing incident, for it is causing no disturbance and the man does not know how or when it got there. There is no history of it having been swallowed or inbaled or of it having entered through the back.

Laryngeal examination made by Dr. Hollis, of our staff, showed undoubted laryngeal tuberculosis with ulceration and marked swelling of the arytenoids, and it is at Dr. Hollis' suggestion that I perform a gastrostomy here, that the man may be fed and his threatening dehydration prevented.

This operation as it is usually done today is quite a simple one, and consists of a longitudinal incision through the upper part of the left rectus muscle and the introduction of a good-sized catheter through an opening made in the anterior stomach wall.

Fortunately, in this case I find the stomach large and its walls of normal thickness, and I will, therefore, do what is known as the Senn operation. I will puncture the stomach wall midway between the two curvatures, and as high as possible, with the actual cautery. This, as you see, is easily and quickly done, and now in goes the catheter for 3 or 4 inches, and I will fasten it to the margin of the stomach opening by No. 1 chromic gut. In order to prevent leakage it is necessary to invert the stomach wall by introducing a purse-string suture of linen around the catheter, tying the same while the catheter is pushed in. A second linen suture is applied in the same way and still further inverts the stomach wall, producing, as you see, an inverted cone. All that now remains to be done is to tack the anterior gastric wall to the parietal peritoneum and close the wound. Before doing so, however, I will take a large glass syringe filled

with peptonized milk and inject it into the stomach cavity not merely because the patient needs nourishment as promptly as possible but also to see if there is any leakage from the stomach around the catheter

The postoperative results in cases necessitating gastrostomy are usually quite brilliant these patients gain in strength even in weight and improve in facial and physical appearance to a remarkable degree

(This man regained his strength quite rapidly under the artificial feeding and his tuberculosis is yielding nicely to local treatment)

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